

**Beatty's Cottage
Co. Dublin**

**Site Specific Flood Risk
Assessment Report**

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1 Introduction

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 the vicinity of Beatty's Cottage 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 SDCC Development Plan 2022-2028 Strategic Flood Risk Assessment (SFRA).

1.3 Existing Site

The proposed site is located adjacent to the Grand Canal Way near the 12th Lock in Lucan, Co Dublin and is part of a parcel of land in the ownership of South Dublin County Council.

The main part of the development site is flat with a level of circa +62.00m AOD. There are a number of protected agricultural structures on the site that have fallen into a derelict state. The lands within the site fall towards the river running through the site.



Figure 1.1 - Site Location

The site adjacent to the Grand Canal and the Griffeen River flows through the site.

1.4 Proposed Development

The proposed development comprises the conservation and restoration of the existing structures on the site along with associated site development works. The existing structures shall be restored to serve as a mixed-use development which includes a childcare facility, café, events space, artists studios and clubhouse.

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.”

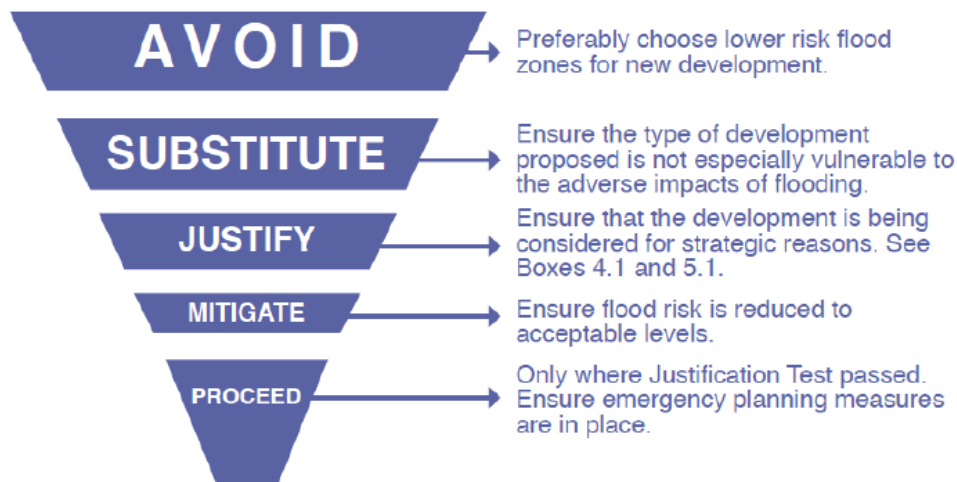


Figure 2.1 - Sequential Approach Principles in Flood Risk Management

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).

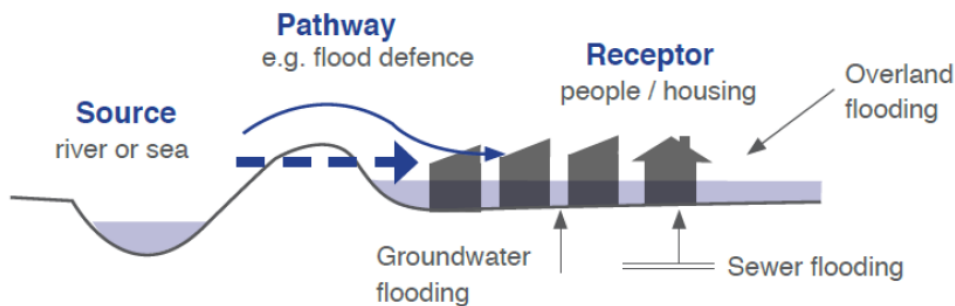


Figure 2.2 - Source - Pathway - Receptor Model

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.

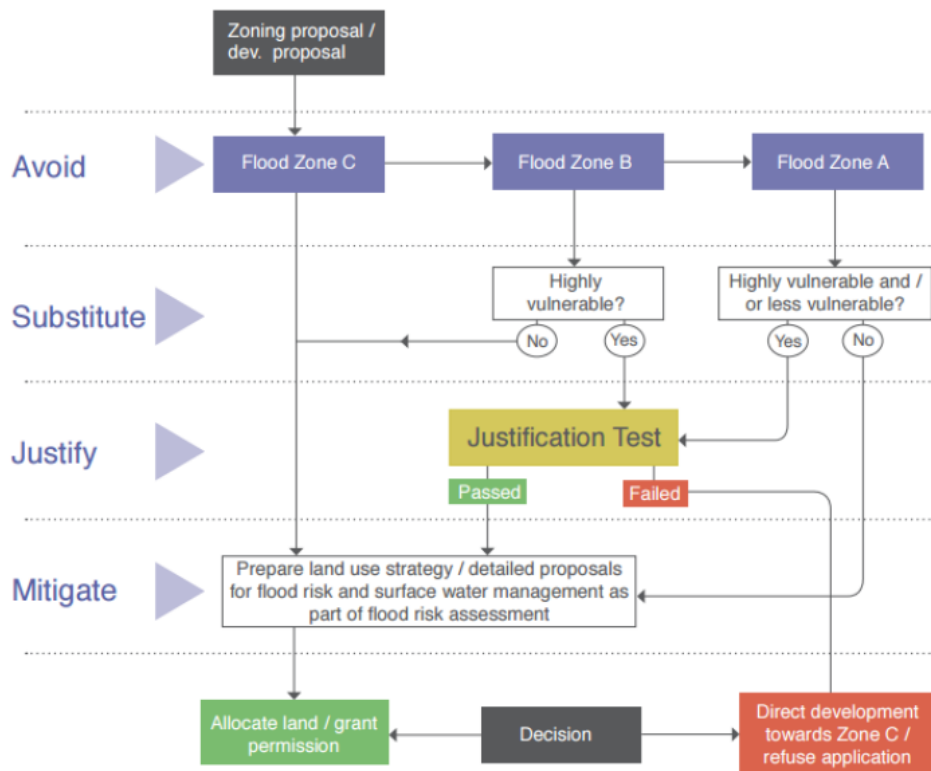


Figure 2.3 - Sequential Approach Mechanism in the Planning Process

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 2.4 - 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 commercial. 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.

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	Y
	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, however it is located very near this flood zone.	N
	SDCC Development Plan SFRA	Local	High	High	Development is located within Flood Zone A and B	Y
Secondary Data Source	Walkover Survey	Local	Varies	Varies	A group of protected agricultural structures surrounding a courtyard.	N
	OPW Historic Flood Records	Nationwide	Varies	Varies	No records of site flooding.	N
	Historic OSI Maps	Nationwide	Moderate	Low	Site occupied with structures since 19 th century	N
	Drainage Records	Nationwide	Moderate	Moderate	Existing below ground drainage connection to Uisce Eireann Network	N
	Topographic Surveys	Local	High	High	Flat site with constant level of +62.00 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 floodmaps.ie website the site has not suffered from flooding in the past. There are records of flooding to the North of the site at Adamstown and to the South on the R120.

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 the <https://www.floodinfo.ie/map/floodmaps/> website. The maps show the site is in Flood Zones A and B.

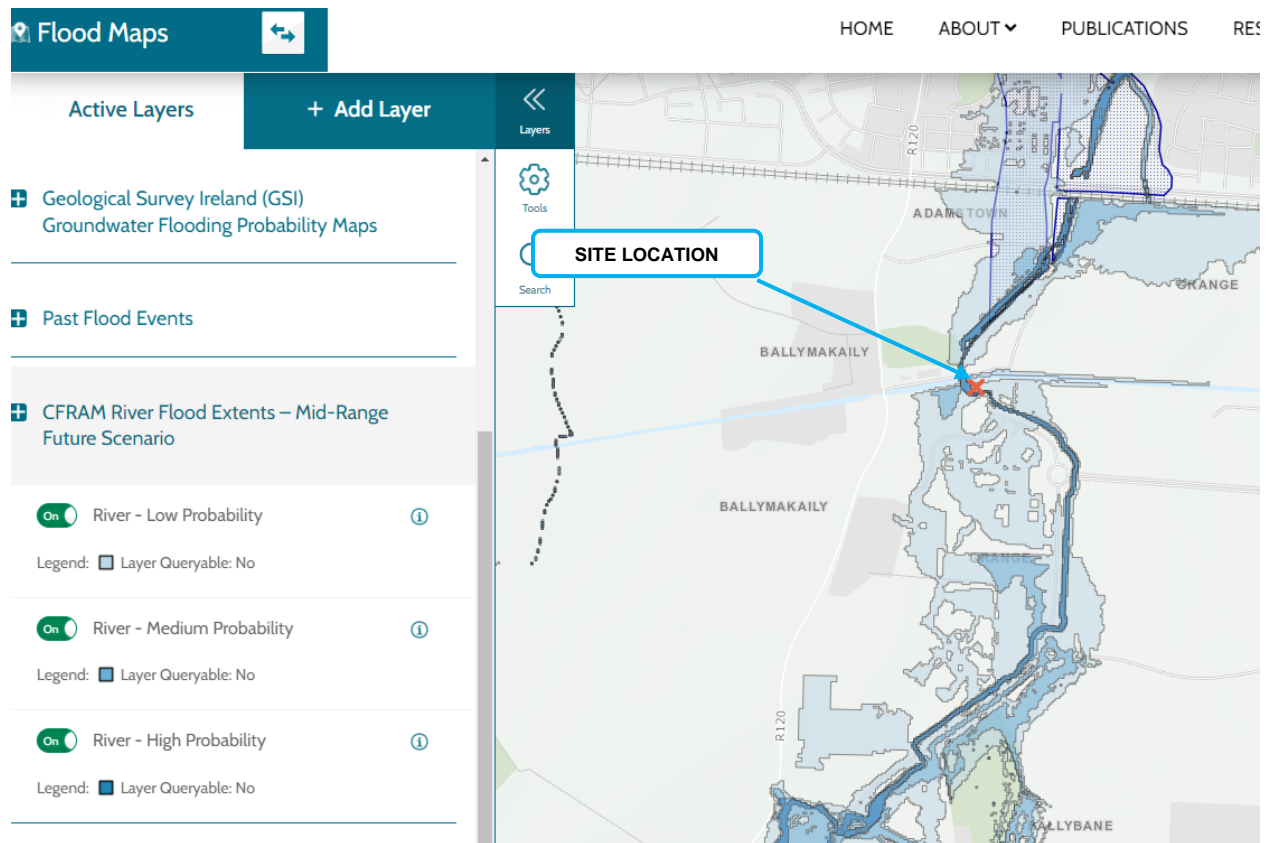


Figure 3.1 - Fluvial Flooding

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 the site is a long way from any coastal effects.

Pluvial Flood Risk

There is no Pluvial Flood Risk identified for the site as it is located well away from other development sites and the topography suggests that there is no overground flooding to the buildings.

3.2.2 SFRA SDCC Development Plan 2022-2028

The Strategic Flood Risk Assessment (SFRA), which was prepared to accompany the South Dublin County Council (SDCC Development Plan 2022- 2028 assess all the types of flood risk within in the SDCC County jurisdiction area identifying principal rivers and sources of flooding, producing flood maps, assessing potential impacts of climate change, and identifying the location of any flood risk management infrastructure.

As part of the SFRA, a Flood Zone Map has been prepared for the Rathcoole Ara with and extract of this map below. The site is located in Flood Zones A & B.



Figure 3.2 - Extract from SDCC Strategic Flood Risk Assessment, Development Plan 2022-2028

3.2.3 Topographical Survey

After reviewing the Topographical survey, the subject site is generally level. The survey indicates existing ground floor level of +62.00 AOD which has served the protected structure & courtyard area.

3.2.4 Walkover Survey

From a walkover of the site it is clear that the subject site ties in with the topographical survey.

3.2.5 AECOM Stage 2 Flood Risk Assessment.

A Flood Risk Assessment was carried out in April 2023 by AECOM for the wider site and lands within the ownership of SDCC. This report concluded that this site is location within Flood Zones A & B and a number of mitigation measures were identified:

- A recommended FFL of 60.31m OD would be required based on current day flood modelling.
- The internal drainage should be designed to account for possible high groundwater levels, or this may be mitigated by undertaking groundwater monitoring within the site.
- The site drainage should include measures to mitigate the risk of backflow into the network from the Griffeen River during rainfall events. The Surface Water design shall be in accordance with

the GSDSDS and include attenuation proposals to cater for the 100-year critical storm event plus 30% for climate change.

- A flood risk management plan should be put in place for the development, including measures to evacuate the buildings in the event of any possible future flood events.

3.3 Initial Flood Risk Assessment

The site is located in Flood Zone A and B and the recommendations of the AECOM Flood Risk Assessment should be considered with respect to the proposed development.

3.4 Flood Zone Category

The AECOM Flood Risk Assessment has been thoroughly carried out and identifies that the site is in Flood Zone A & B.

4 Stage 3 – Detailed Flood Risk Assessment

The detailed Flood Risk assessment stage will look more closely how the proposed development will mitigate flood risk from the identified sources within the AECOM Report and to compare the proposed mitigation measures noted in section 3.2.5 above with the proposed development.

4.1 Proposed Finished Floor Level

AECOM have identified a proposed FFL of 62.6m to be considered for the future scenario. For the proposed development there are no new structures to be constructed and that the development consists of the refurbishment of the existing buildings on the site and to maintain the existing finished floor level of +62.0m AOD. The existing topographical profile shall also be maintained. Therefore the current day scenario shall be applicable to this proposed development.

The Conclusion of the AECOM FRA report recommends a minimum Finished Floor Level of 60.31mOD for these lands which includes 500mm of freeboard. The existing FFL is well above this level and as the use of the buildings has already been identified as being Less Vulnerable.

4.2 Site Drainage

The refurbishment works shall include a completely separate wastewater discharge and stormwater management of the site.

Wastewater shall be connected directly to the existing system which is connected to the Uisce Eireann network.

Stormwater management shall include nature based solutions where all stormwater shall be retained on site and soak naturally to ground within the soft landscaping areas external to the existing buildings and courtyards.

Additional SUDS measures shall be introduced to soften the courtyard areas such as Planters and tree pits.

The storm water treatment system is designed for the 1 in 100 year storm plus 30% for climate change and the implementation of the nature based solutions to treat stormwater is a significant improvement to the current situation on the site.

4.3 Flood Risk Management Plan

4.3.1 Flood Barriers.

Demountable flood barriers shall be employed for main entrances to the buildings within the site. Typical details are shown below.



Figure 4.1 - Typical Demountable Flood Barrier

Entrance thresholds shall be suitably sloped to allow over ground flows to be directed away from the buildings in line with local topography to the external courtyards.

4.4 Flood Warning and Evacuation

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 Site Facility Management can communicate with the Local Authority and the building users with regard to Flood Warning, the installation of the Demountable Barriers and any Evacuation procedures that may be necessary.

The emergency and evacuation plan is contained in Appendix A.

5 Conclusion

This SSFRA concludes the following;

- The proposed development site is within Flood Zone A & B for tidal flooding, however the proposed development is to refurbish the existing buildings and improve the overall quality of the site.
- As part of the development proposals, a Warning and Evacuation Plan will be implemented to ensure the site users are aware of the potential risks of flooding.

Appendix A – Emergency and Evacuation Plan

Emergency and Evacuation Plan

1 General Precautions and Information

- The time of first inundation of the site could be fast, and with little warning due to unknown status of a breach. Although, it is likely the Local Authority will have prior warning of the increased flood levels and have a flood warning for the area in effect.
- Ensure all occupants are aware of this plan, understand it and are fully briefed on the risk assessment, and provide basic training to any children at the site.
- The occupants and site users will need to be aware that during a flood event there is likely to be a failure of the utilities.
- Ensure multiple emergency flood boxes are located within each and are accessible. This should be checked and maintained as part of a bi-annual check.
- The occupants should be aware of higher risk periods e.g. high spring tides, paying particular attention to weather conditions and flood warnings during these times.
- Local Authorities operate a flood warning procedure and occupants and site users are encouraged to sign up to notification systems such as MapAlerter (www.mapalerter.com/alerts/floods) and check websites such as meteoalarm (www.meteoalarm.eu) to ensure they are aware of any flood warnings in place for the area. These warnings are published on the Local Authorities website with more details of how to prepare for flooding available through the OPW Website, ww.flooding.ie. The site Facilitator's Management Team shall ensure that a responsible person(s) is employed to undertake this duty.
- This plan should be a live document and may need to be updated in the future as a result of local policies and strategies being changed. This Flood Plan should be amended as necessary with a log kept of any changes and reasons for change. This should be completed following any revisions.

2 Response to Flood Alert or Flood Warnings

Once a 'Flood Alert or 'Flood Warning' has been reported, the following actions will be undertaken.

The Local Authority & Met Eireann are responsible for issuing severe flood warnings and residents and site users should listen to local media and watch other media to assess the developing situation.

Emergency Flood Boxes will be checked for contents. (See Appendix 2 for box contents)

2.1 Response to Severe Flood Warnings

Once a 'Severe Flood Warning' has been issued, the following actions should be taken.

For occupants of the development:

1. Obtain the Emergency Flood Box.
2. Assemble all occupants and visitors to a designated area which is raised above the flood level.
3. Avoid evacuation wherever possible, as it will be very difficult to evacuate people from the site to an area outside the floodplain using a designated safe route. Access to the evacuation route and trafficability can be lost early in the flood because of rising floodwaters. Evacuation must be organised by the emergency services in this instance.
4. Contact the emergency services.
5. Depending on the level of flood risk and its imminence the emergency services will advise the public on the quickest and safest way off the property.

**IMPORTANT: DO NOT RE-ENTER THE PROPERTY UNTIL INSTRUCTED TO DO SO
BY LOCAL AUTHORITY OR THE EMERGENCY SERVICES**

**NO ACTIONS SHOULD BE TAKEN WHICH COMPROMISE THE SAFETY OF THE
PERSONS INVOLVED**

APPENDIX 1: Warning System

(Following Met Eireann's Weather Warning System)

1: STATUS YELLOW – Flood Alert

Flooding is possible. Be prepared - Is used from two hours to two days in advance of flooding.

Following Actions:

- Watch water levels
- Monitor local news and weather forecasts on radio, TV or internet.
- Make sure you have what you need to put your flood plan into action.
- Check flood kit is fully equipped.
- Alert your neighbours, particularly the elderly and less able.
- Reconsider travel plans.
- Ensure all occupants in your property are accounted for.

2: STATUS ORANGE – Flood Warning

Flooding is expected. Immediate action is required - Is used from half an hour to one day in advance of flooding.

Following Actions:

As with Flood Alert plus;

- Move valuables and other items to safety.
- Prepare flood kit.
- Prepare to turn off gas, electricity and other services.
- Be prepared for evacuation.
- Protect yourself and others that need your help.

3: STATUS RED – Severe Flood Warning

Severe flooding. Danger to life - Is used when flooding poses a significant threat to life.

Following Actions:

As with Flood Warning plus;

- Stay in a safe place.
- Turn off gas, electricity and water supplies if safe to do so
- Try to keep calm, and to reassure others, especially children
- Co-operate with emergency services and local authorities
- Prepare for evacuation.
- Call 999/112 if you are in immediate danger.

In the Event of a Breach Scenario no warning may be provided and the first sign of flooding may be water entering the site. In this situation ensure all site users are safely gathered inside the building and contact the emergency services. Follow the actions as shown on the Severe Flood Warning.

APPENDIX 2: Emergency Flood Box Contents

1. Encapsulated procedure checklist for Flood Officer with pen
2. Torch and battery back-up for mobile phone/tablet or dynamo radio
3. A first-aid kit, including a supply of any essential medication
4. Red and white hazard tape
5. A list of useful telephone numbers
6. An up to date copy of flood warning information (Met Eireann/Local Authority)

Procedure list is to assist in delivery of the response plan:

Priority	Action	Complete
1	Account for all occupants and inform about flood warning	
2	Continue to monitor situation but watching/ listening to media	
3	Gather occupants and visitors to designated area above flood level.	
3	Contact Emergency Services	
LEAVE THE PROPERTY FOLLOWING EMERGENCY SERVICES INSTRUCTIONS		