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Flood Risk Statement

Project:

Sandy Road Site, Galway,
Spatial Framework

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1. INTRODUCTION AND POLICY BACKGROUND

1.1 INTRODUCTION

The Land Development Agency (LDA), in partnership with Galway City Council (GCC), is in the process of preparing a Spatial Framework for lands bounding Sandy Road, Galway City, which will deliver on the transformative potential of the Sandy Road area. The objective of the Spatial Framework is to develop a comprehensive vision for the future development of these lands, with a particular focus on optimising brownfield and underutilised areas. Figure 1.1 shows the subject site and surrounding areas. Figure 1.2 is an aerial view of the site with topographical survey levels added.

Flooding is the overflowing of water onto land that is normally dry. It can arise from rivers, the sea and estuaries, heavy rain, groundwater and the failure/overwhelming of infrastructure. It is an environmental phenomenon which, as well as causing economic and social impacts, could, in certain circumstances, pose a risk to human health.

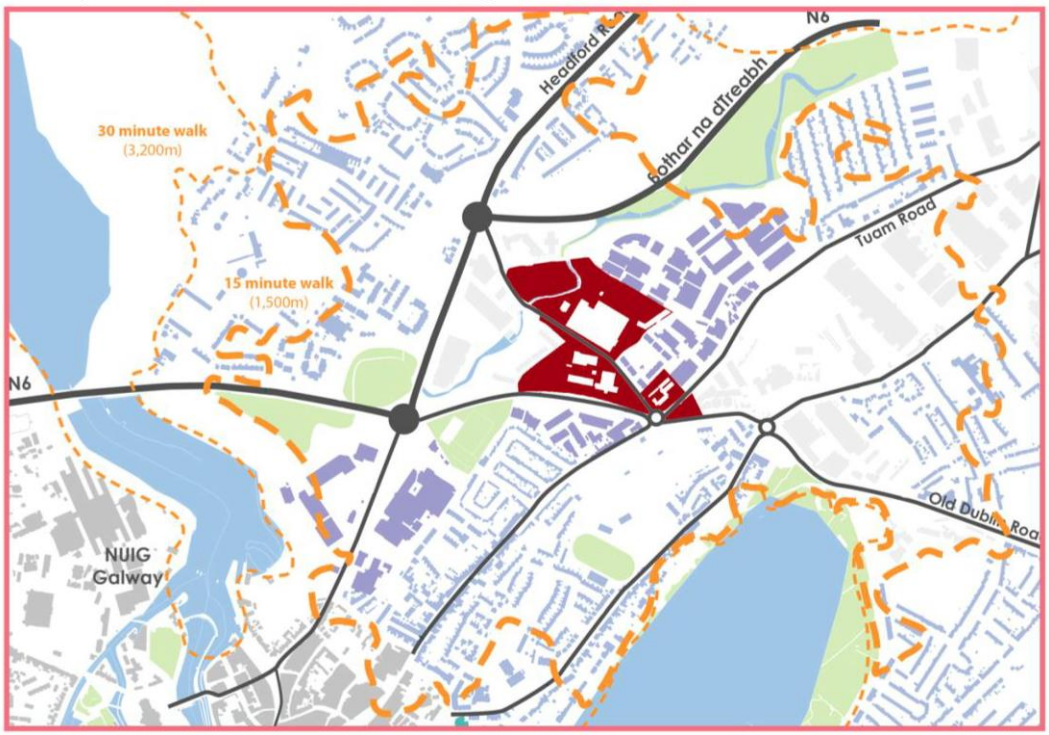


Figure 1.1 Site Location Map

1.2 DRAFT FRAMEWORK

The draft Framework is a non-statutory document intended to inform and guide the future development of lands at Sandy Road in Galway City, in accordance with Draft Policy 10.2 'Strategic Regeneration and Opportunity Sites' of the Draft Galway City Development Plan 2023-2029, which provides for the redevelopment of this strategic site.

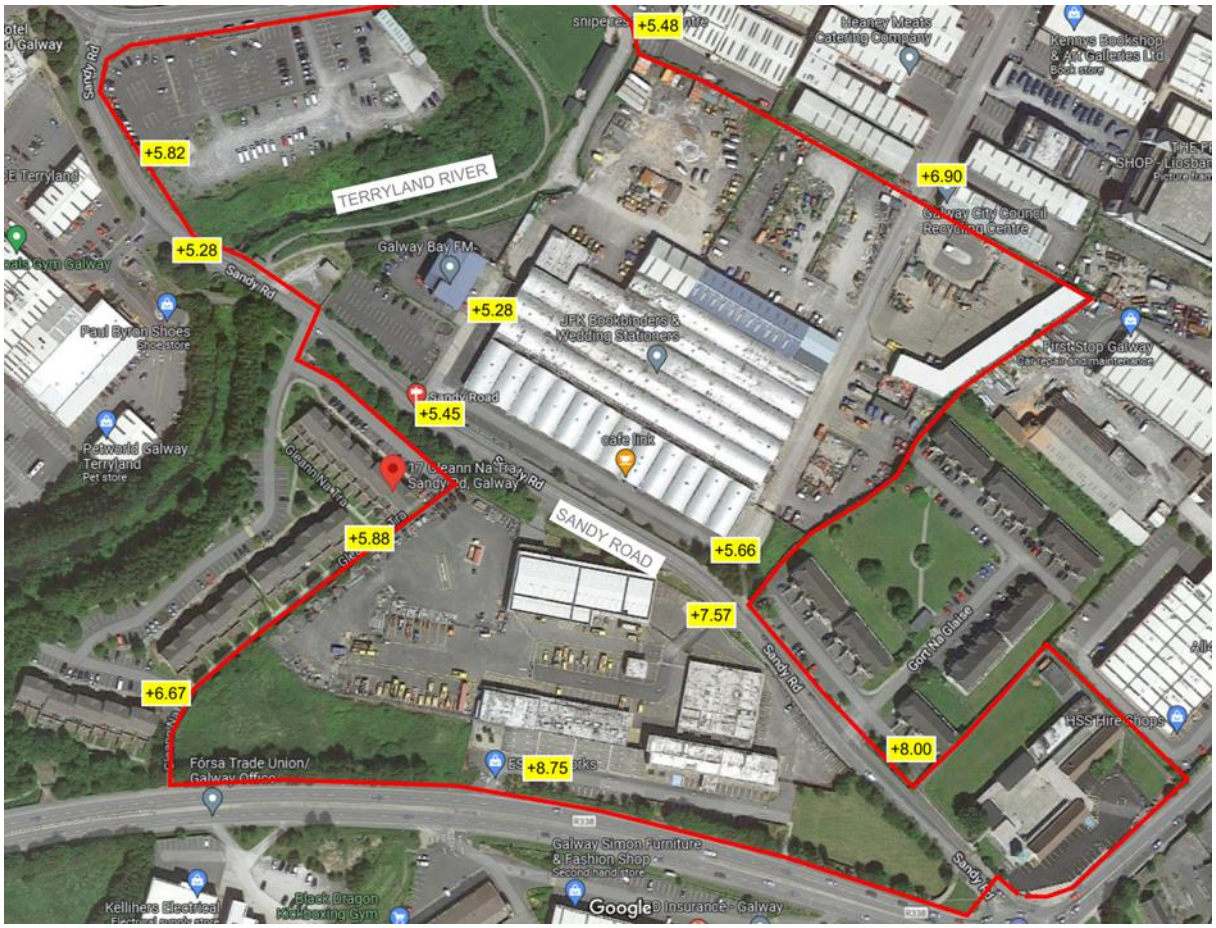


Figure 1.2 Aerial View of the site with spot levels shown.

1.3 FLOOD RISK MANAGEMENT POLICY

1.3.1 EU Floods Directive

The European Directive 2007/60/EC on the assessment and management of flood risk aims to reduce and manage the risks that floods pose to human health, the environment, cultural heritage and economic activity. The Directive applies to inland waters as well as all coastal waters across the whole

territory of the EU. The Directive requires Member States to:

- Carry out a preliminary assessment by 2011 in order to identify the river basins and associated coastal areas where potential significant flood risk exists (preliminary mapping was prepared and a list of Areas for Further Assessment finalised in 2012).
- Prepare flood extent maps for the identified areas (finalised in 2016 for inclusion in Flood Risk Management Plans – see below).
- Prepare flood risk management plans focused on prevention, protection and preparedness. These plans are to include measures to reduce the probability of flooding and its potential consequences. These Plans were adopted in 2018.

Implementation of the EU Floods Directive is required to be coordinated with the requirements of the

EU Water Framework Directive and the current National River Basin Management Plan.

1.3.2 National Flood Policy

Recent policy is based on the Report of the Flood Policy Review Group, OPW, 2004. The adopted policy was accompanied by recommendations, including the following:

- Focus on managing flood risk, rather than relying only on flood protection measures aimed at reducing flooding;
- Take a catchment-based approach to assess and manage risks within the whole-catchment context; and
- Be proactive in assessing and managing flood risks, including the preparation of flood maps and flood risk management plans.

1.3.3 National CFRAM Programme

The national Catchment Flood Risk Assessment and Management (CFRAM) programme commenced in Ireland in 2011. The CFRAM Programme is intended to deliver on core components of the National Flood Policy, adopted in 2004, and on the requirements of the EU Floods Directive. The Programme is being implemented through CFRAM studies that have been undertaken for each of the river basin districts in Ireland. The CFRAM Programme comprises three phases as follows:

- The Preliminary Flood Risk Assessment1 (PFRA) mapping exercise, which was completed in 2012.
- The CFRAM Studies and parallel activities, with Flood Risk Management Plans finalised in 2018.
- Implementation and Review.

The OPW is the lead agency for flood risk management in Ireland. The coordination and implementation of Government policy on the management of flood risk in Ireland is part of its responsibility. The European Communities (Assessment and Management of Flood Risks) Regulations 2010 (S.I. No. 122) identifies the Commissioners of Public Works as the 'competent authority' with overall responsibility for implementation of the Floods Directive 2007/60/EC. The OPW is the principal agency involved in the preparation of CFRAM Studies.

1.3.4 Flood Risk Management Guidelines

1.3.4.1 Introduction

In 2009, the OPW and the then Department of the Environment and Local Government (DEHLG) published Guidelines on flood risk management for planning authorities entitled The Planning System and Flood Risk Management - Guidelines for Planning Authorities. The Guidelines introduce mechanisms for the incorporation of flood risk identification, assessment and management into the planning process. Implementation of the Guidelines is intended to be achieved through actions at the national, regional, local authority and site-specific levels. Planning authorities and An Bord Pleanála are required to have regard to the Guidelines in carrying out their functions under the Planning Acts. The core objectives of the Guidelines are as follows:

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

- Ensure that the requirements of EU and national law in relation to the natural environment and nature conservation are complied with at all stages of flood risk management.
-

1.3.4.2 Principles of Flood Risk Management

The key principles of flood risk management set out in the flood Guidelines are to:

- Avoid development that will be at risk of flooding or that will increase the flooding risk elsewhere, where possible;
- Substitute less vulnerable uses, where avoidance is not possible; and
- Mitigate and manage the risk, where avoidance and substitution are not possible.

The Guidelines follow the principle that development should not be permitted in flood risk areas, particularly floodplains, except where there are no alternative and appropriate sites available in lower risk areas that are consistent with the objectives of proper planning and sustainable development.

Development in areas that have the highest flood risk should be avoided and/or only considered in exceptional circumstances (through a prescribed Justification Test) if adequate land or sites are not available in areas that have lower flood risk. Most types of development would be considered inappropriate in areas that have the highest flood risk. Only water-compatible development such as docks and marinas, dockside activities that require a waterside location, amenity open space, outdoor sports and recreation and essential transport infrastructure that cannot be located elsewhere would be considered appropriate in these areas.

1.3.4.3 Stages of Strategic Flood Risk Assessment

The Flood Risk Management Guidelines recommend a staged approach to flood risk assessment that covers both the likelihood of flooding and the potential consequences. The stages of appraisal and assessment are as follows:

- Stage 1 Flood risk identification – to identify whether there may be any flooding or surface water management issues related to either the area of Regional Spatial and Economic Strategies, Development Plans and LAP's or a proposed development site that may warrant further investigation at the appropriate lower-level plan or planning application levels.
- Stage 2 Initial flood risk assessment – to confirm sources of flooding that may affect a Plan area or proposed development site, to appraise the adequacy of existing information and to scope the extent of the risk of flooding which may involve preparing flood zone maps. Where hydraulic models exist the potential impact of a development on flooding elsewhere and of the scope of possible mitigation measures can be assessed. In addition, the requirements of the detailed assessment are scoped.
- Stage 3 Detailed flood risk assessment – to assess flood risk issues in sufficient detail and to provide a quantitative appraisal of potential flood risk to a proposed or existing development or land to be zoned, of its potential impact on flood risk elsewhere and of the effectiveness of any proposed mitigation measures.

1.3.4.4 Flood Zones

Flood risk is an expression of the combination of the flood probability or likelihood and the magnitude of the potential consequences of the flood event. It is normally expressed in terms of the following relationship: Flood risk = Likelihood of flooding x Consequences of flooding

Likelihood of flooding is normally defined as the percentage probability of a flood of a given magnitude or severity occurring or being exceeded in any given year. For example, a 1% Annual Exceedance Probability (AEP) indicates the severity of a flood that is expected to be exceeded on average once in 100 years, i.e. it has a 1 in 100 (1%) chance of occurring in any one year.

Consequences of flooding depend on the hazards associated with the flooding (e.g. depth of water, speed of flow, rate of onset, duration, wave-action effects, water quality) and the vulnerability of people, property and the environment potentially affected by a flood (e.g. the age profile of the population, the type of development and the presence and reliability of mitigation measures).

Flood zones are geographical areas within which the likelihood of flooding is in a particular range and they are a key tool in flood risk management within the planning process as well as in flood warning and emergency planning.

There are three types of flood zones defined for the purposes of the Flood Guidelines:

- Flood Zone A – where the probability of flooding from rivers and the sea is highest (greater than 1% or 1 in 100 for river flooding or 0.5% or 1 in 200 for coastal flooding);
- Flood Zone B – where the probability of flooding from rivers and the sea is moderate (between 0.1% or 1 in 1000 and 1% or 1 in 100 for river flooding and between 0.1% or 1 in 1000 year and 0.5% 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% or 1 in 1000

1.4 Corrib Go Costa Flood Relief Scheme

This is the proposed flood relief scheme for Galway City being carried out on foot of the OPW Western CFRAM flood mapping studies. The objective of Coirib go Cósta 'is the identification, design and submission (for planning consent) of a Flood Relief Scheme, that is technically, socially, environmentally, aesthetically and economically acceptable, to alleviate the risk of flooding to the Community of Galway City to a determined Standard of Protection and subsequent construction of the Scheme.' The proposed timelines are set out in Fig 1.7 below, abstracted from the project website. The study includes the Terryland River which runs through the subject site.

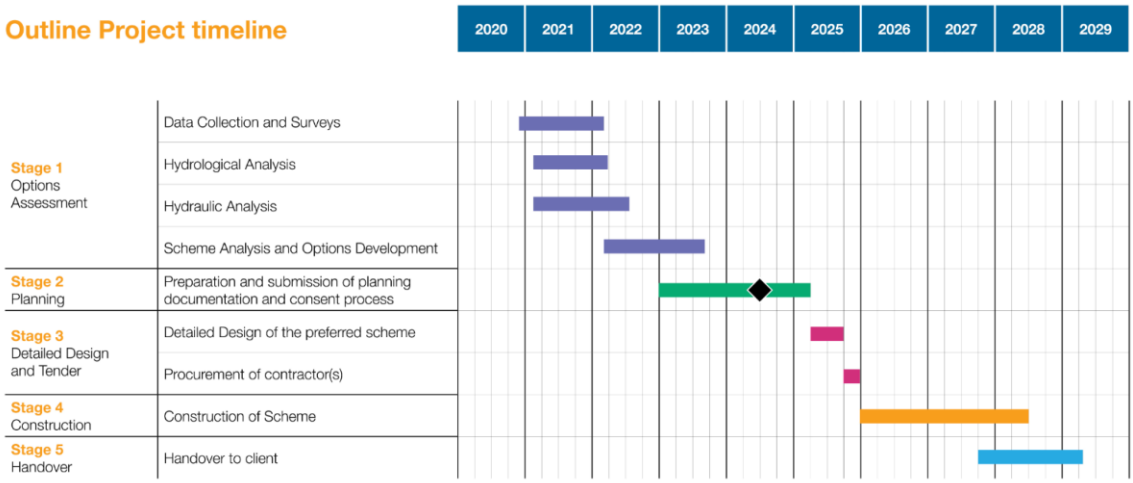


Fig 1.3 Extract from the Corrib go Costa website showing the proposed timelines for the flood relief scheme.

2. RELEVANCE OF FLOOD RISK TO THE DRAFT SPATIAL FRAMEWORK

2.1 EFFECTS THAT CAN OCCUR AS A RESULT OF FLOODING

Consequences of flooding depend on the hazards associated with the flooding (e.g. depth of water, speed of flow, rate of onset, duration, wave-action effects, water quality), and the vulnerability of people, property and the environment potentially affected by a flood (e.g. the age profile of the population, the type of development, presence and reliability of mitigation measures etc.).

Non-Human Impacts include:

- Damage to buildings (houses).
- Damage to contents of buildings.
- Damage to new infrastructure e.g. roads Increased stress.
- Loss of income.
- Disruption of flow of employees to work causing knock on effects.
- Enhanced rate of property deterioration and decay.
- Long term rot and damp.
- Loss of uninsured possessions.

Human Impacts:

- Loss of life. Physical injury. Increase in ill-health.
- Increased stress. Increase in flood related suicide.
- Homelessness.

2.2 FLOOD RISK AT THE SANDY ROAD REGENERATION SITE

2.2.1 Introduction

The Draft Strategic Flood Risk Assessment (SFRA) for Galway City identifies a number of 'regeneration and opportunity sites' including the Sandy Road site. The report identifies the flood zoning on the site. The Sandy Road site is in Zones A ,B & C (zones defined in Section 1.3.4.4).

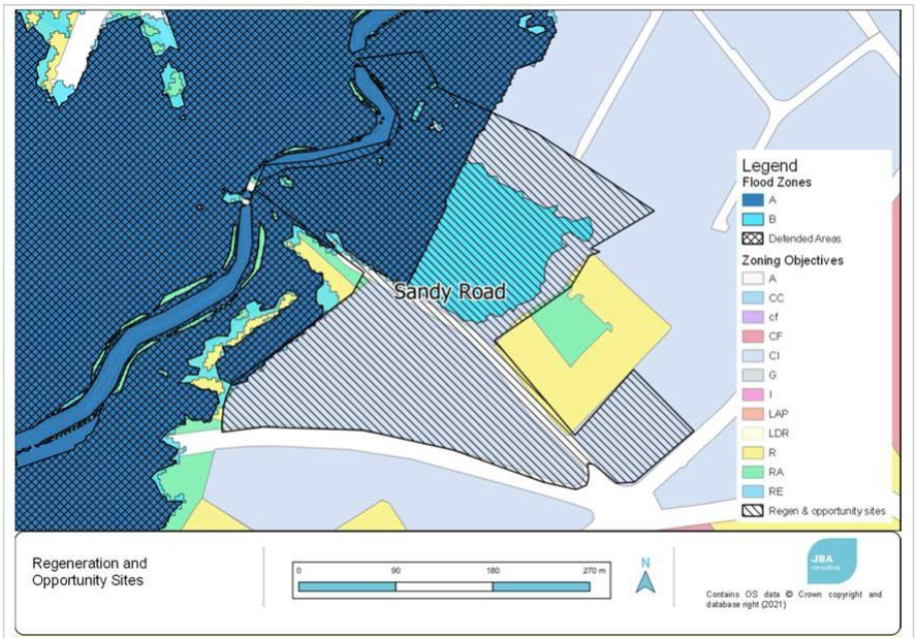


Fig 2.1 Extract from Section 7.9 of the Galway City Council Draft SFRA

The flood risk on the site is associated with the Terryland River which runs through the site. The proposed new 'Regeneration and Opportunity Site' designation in the Draft Galway City Development Plan is relevant in the context of flood risk given the higher vulnerability of residential development, and given that the proposed development in the Sandy Road site is primarily residential. Following the sequential approach outlined in the OPW Guidelines, residential development should be directed towards areas in Flood Zone C.

Table 2.1 Classification of Vulnerability of different types of development abstracted from the OPW Guidelines

Vulnerability class	Land uses and types of development which include*:
Highly vulnerable development (including essential infrastructure)	Garda, ambulance and fire stations and command centres required to be operational during flooding; Hospitals; Emergency access and egress points; Schools; Dwelling houses, student halls of residence and hostels; Residential institutions such as residential care homes, children's homes and social services homes; Caravans and mobile home parks; Dwelling houses designed, constructed or adapted for the elderly or, other people with impaired mobility; and Essential infrastructure, such as primary transport and utilities distribution, including electricity generating power stations and sub-stations, water and sewage treatment, and potential significant sources of pollution (SEVESO sites, IPPC sites, etc.) in the event of flooding.
Less vulnerable development	Buildings used for: retail, leisure, warehousing, commercial, industrial and non-residential institutions; Land and buildings used for holiday or short-let caravans and camping, subject to specific warning and evacuation plans; Land and buildings used for agriculture and forestry; Waste treatment (except landfill and hazardous waste); Mineral working and processing; and Local transport infrastructure.
Water-compatible development	Flood control infrastructure; Docks, marinas and wharves; Navigation facilities; Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location; Water-based recreation and tourism (excluding sleeping accommodation); Lifeguard and coastguard stations; Amenity open space, outdoor sports and recreation and essential facilities such as changing rooms; and Essential ancillary sleeping or residential accommodation for staff required by uses in this category (subject to a specific warning and evacuation plan).
*Uses not listed here should be considered on their own merits	

Table 2.2 Matrix of vulnerability versus flood zone to illustrate appropriate development and that required to meet the Justification Test (abstracted from the OPW Guidelines).

	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

2.2.2 Flood Risk Management Related Measures

In relation to flood risk management, compliance is required with the Galway City Council Draft City Development Plan 2023-2029. An extract from the Draft DP showing the policies related to flood risk management is given below in Figure 2.2.

Policy 9.1 Flood Risk

1. Support, in co-operation with the OPW, the implementation of EU Flood Risk Directive (2007/60/EC), the Flood Risk Regulations (SI No, 122 of 2010) and the DECLG and OPW Guidelines for Planning Authorities, the Planning System and Flood Risk Assessment Management (2009), updated/superseding legislation or departmental guidelines and have regard to the findings and relevant identified actions of the Corrib Catchment Flood Risk Management (CFRAM) Study.
2. Support and facilitate the implementation of the Coirib go Cósta Galway City Flood Relief Scheme in conjunction with the OPW to support a climate resilient city, protect against flooding and minimise the impact of future climate events. Support in general the associated mitigation and adaptation measures in order to prevent flooding and coastal erosion, subject to appropriate environmental, visual, built heritage and other relevant considerations.
3. Ensure the recommendations of the Strategic Flood Risk Assessment (SFRA) for the Galway City Development Plan 2023-2029 are taken into consideration in the assessment of developments in identified areas of flood risk and require site specific Flood Risk Assessment (FRA) and associated design and construction measures where appropriate.
4. Protect and promote sustainable management and uses of water bodies and watercourses from inappropriate development, including rivers, streams, associated undeveloped riparian strips, wetlands and natural floodplains.
5. Ensure flood risk is incorporated into the preparation of any future local area plans, framework plans and masterplans in the city.
6. Ensure any proposed measure designed to alleviate flooding/coastal erosion is subject to Appropriate Assessment in accordance with Article 6 of the EU Habitats Directive, where appropriate.
7. Continue to protect the coastal area and the foreshore and avoid inappropriate development in areas at risk of coastal erosion and/or would cause and escalate coastal erosion in adjoining areas.
8. Protect and maintain, where feasible, undeveloped riparian zones and natural floodplains along the River Corrib and its tributaries.

Figure 2.2 Extract from the Galway City Council Draft City Development Plan 2023-2029. Flood Risk

2.2.3 Detailed Flood Risk Assessment (FRA) Summary

As the site contains Flood Zones Areas A & B, a detailed Flood Risk Assessment was carried out by Barrett Mahony as part of the Masterplanning for the site. A summary of the results of this are outlined below.

1. Flood Levels: The detailed FRA uses existing mapping from the Western CFRAM Study as a base source. This is supplemented by an additional detailed topographical survey which shows that the existing level of the site is typically well above the high probability Flood Zone A level and shows therefore that the extent of Flood Zone A shown in the CFRAM's mapping is conservative.

2. Justification Test: Part 3 of the Development Plan Stage Justification Test was completed as part of the detailed FRA in accordance with the OPW Guidelines. The test demonstrates that development on the site is justified with the application of mitigation measures in the Flood Zone A & B areas.

3. Flood Levels: The detailed FRA uses existing mapping from the Western CFRAM Study as a base source. This is supplemented by an additional detailed topographical survey which shows that the existing level of the site is typically well above the high probability Flood Zone A level and shows therefore that the extent of Flood Zone A shown in the CFRAM's mapping is conservative.

4. Mitigation Measures: Mitigation measures have been put in place in the masterplan to reduce the flood risk on site to acceptable levels. Notwithstanding the fact that the CFRAMs Flood Zone A area is conservative in it's extent on the site, a new parkland area is proposed over the majority of this area, providing flood storage and ensuring minimal reduction in the floodplain area. The proposed residential building ground floor levels in the Flood Zone A&B areas of the site are to be raised 400mm above the predicted 0.1%AEP Zone B flood level to a minimum level of +6.00m OD. Refer to Figure 2.2 below.

5. Phasing: The phasing of the development will tie-in insofar as possible with the predicted programme for completion of the Costa go Corrib Flood Risk Scheme. This is the proposed flood relief scheme for Galway City being carried out on foot of the OPW Western CFRAMS flood mapping studies due for completion early 2029. Refer to Section 1.7 of this report.

6. Terryland River Water Abstraction: Irish Water plan to cease abstracting water from the river in the near future and to move the abstraction point to the River Corrib nearby. GCC have indicated that this will result in an increase in water level of 100mm approx. in the river. This is not deemed significant in terms of development of the Sandy Road site.

7. Pluvial flooding and Overland flows: The site is not considered to be at risk from overland flows from adjacent sites and the design of the development will ensure that any overland flows that occur in the event of a drainage blockage, will not impact adjoining sites.

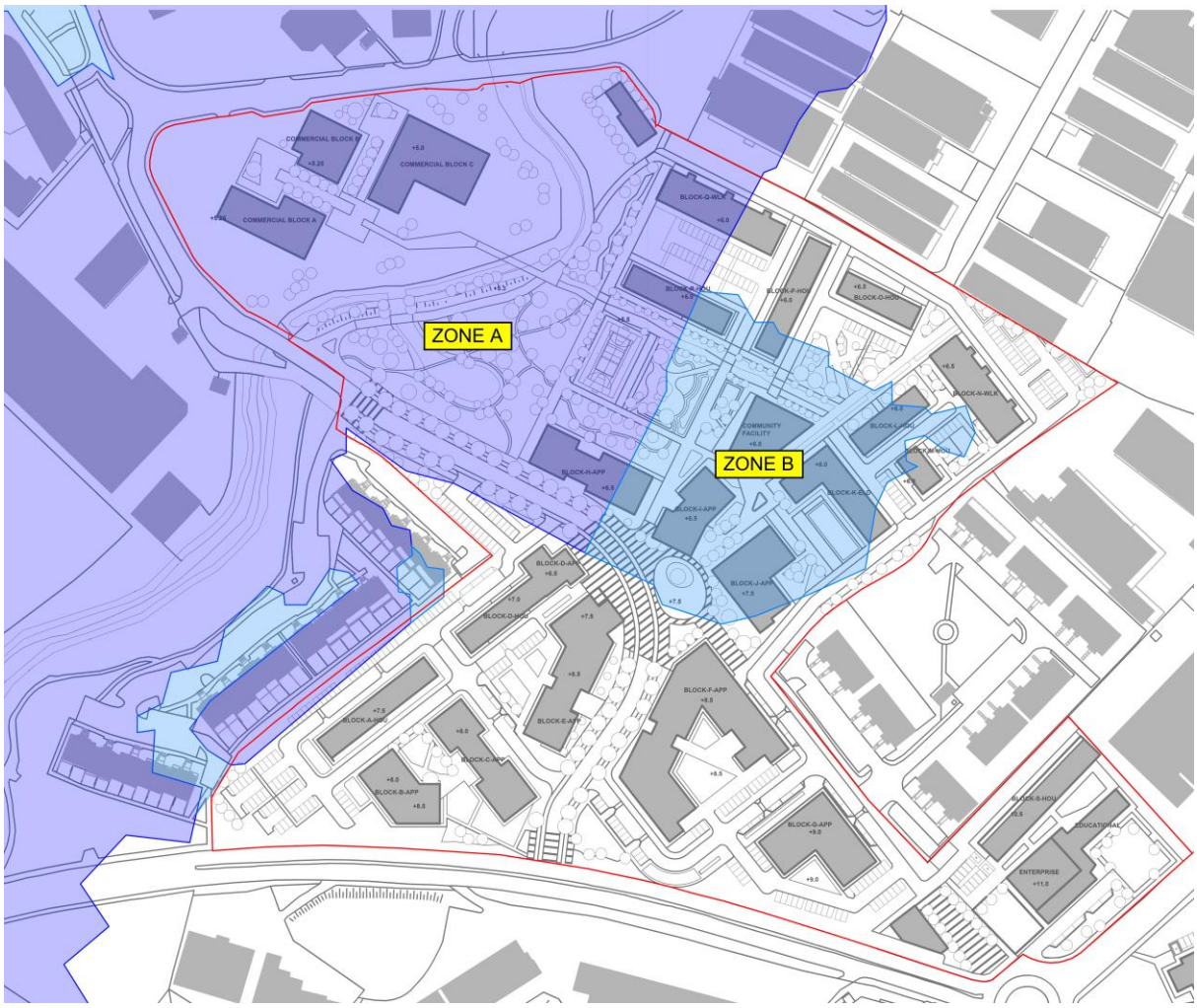
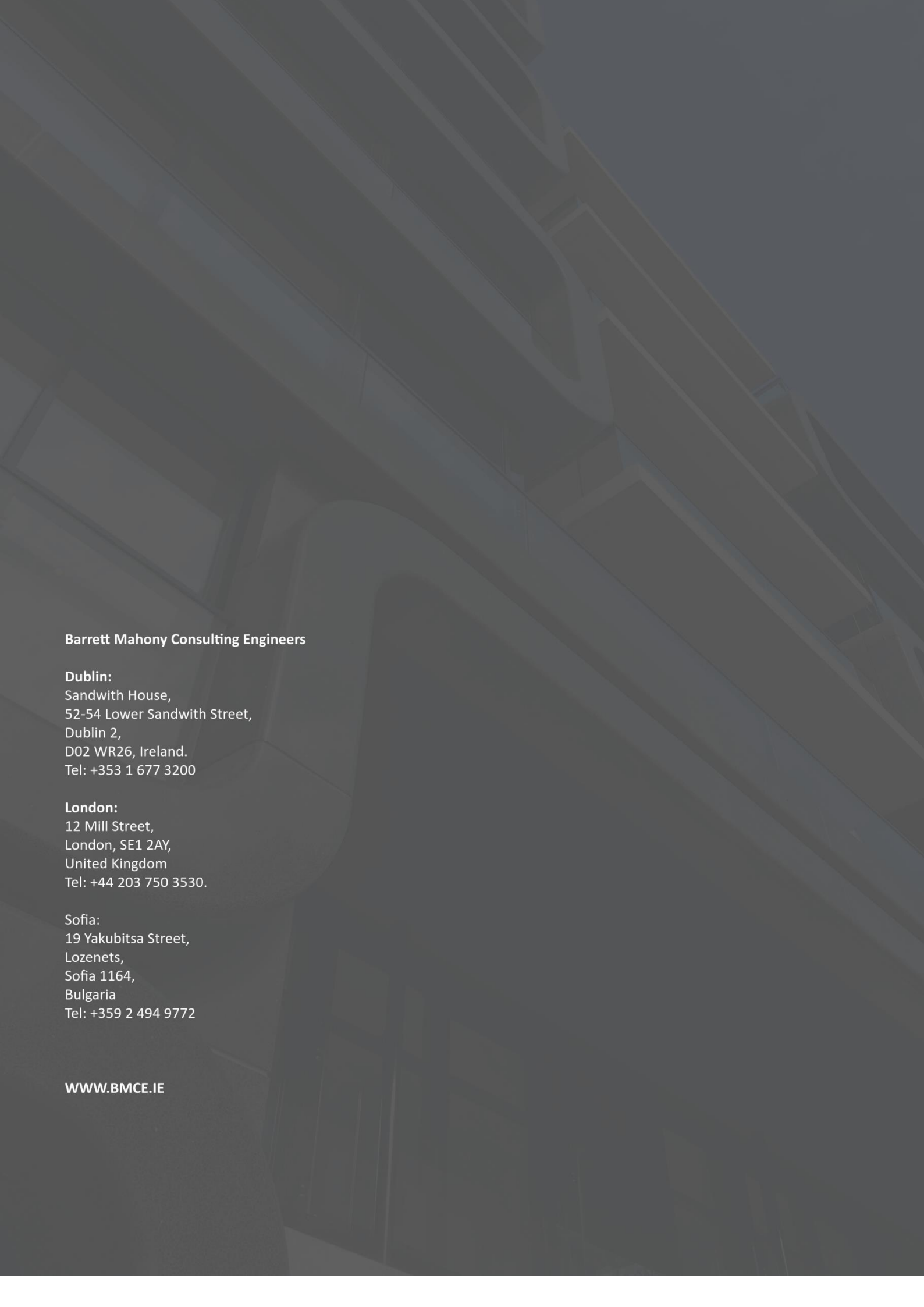


Fig 2.2 Proposed Site Layout showing the flood zoning. Zone C areas not coloured.

3. CONCLUSION

The Land Development Agency has prepared a draft Spatial Framework for land at Sandy Road. The draft Framework is a non-statutory document intended to inform and guide the future development of the site. The draft Framework currently exists separate to the new Draft City Development Plan, which provides for the development of the area and have been subject to environmental assessment. This Plan provides both land use zoning and flood risk management requirements with which the Framework is consistent. These requirements are contained in the Strategic Flood Risk Assessment report (SFRA) and this has informed land use planning within Galway City, including with respect to the new Draft City Development Plan. Taking into account historical and predictive indicators of fluvial flood risk, the SFRA for that Plan has identified Sandy Road as being partially located within the Flood Zone of most flood risk i.e. Flood Zone A.

A detailed Flood Risk Assessment of the site has been carried out by Barrett Mahony. A summary of this assessment is presented in Section 2 of this report. It will be important for proposals for development within the Sandy Road site to demonstrate compliance with the mitigation measures outlined in this summary.



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