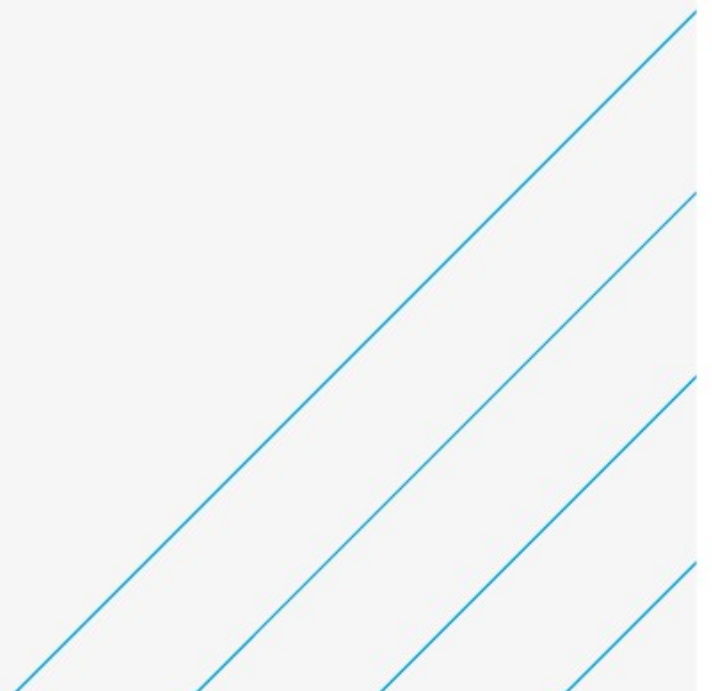


Spring Lane and Ellis Yard Redevelopment, Cork

Stage 1 Flood Risk Assessment

Cork City Council

March 2024



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1. Introduction

Atkins were commissioned by the Cork City Council to prepare a Stage 1 Flood Risk Assessment (FRA) to accompany a planning application for the proposed Spring Lane and Ellis Yard redevelopment in Cork.

1.1. Relevant Guidance

This FRA has been undertaken in consideration with 'The Planning System and Flood Risk Management – Guidelines for Planning Authorities' DOEHLG November 2009, which is the latest guidance document.

The guidance has been issued to ensure that flood risk is a key consideration for developers, planning & regional authorities, and the public in preparing and submitting development proposals. The principles of the guidance are as follows:

- Avoid the risk, where possible
- Substitute less vulnerable users, where avoidance is not possible, and
- Mitigate and manage the risk, where avoidance and substitution are not possible

A staged approach is recommended within the guidance document in relation to identifying and assessing flood risk. The three stages of appraisal and assessment are as follows:

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

1.2. Flood Risk

Flood risk can be quantified by relating the probability of the flood event occurring to the consequence of the flood. Probability, in flood event terms, is gauged by potential annual occurrence/return period and flood consequence is dependent on the nature of the flood hazard and the vulnerability of the inundated area. The source-pathway-receptor model considers the components of flood risk.



The source is the hazard with the potential to cause harm through flooding (e.g. rainfall, high sea levels). The pathway is the mechanism by which the source can affect the receptor (e.g. inadequate drainage, overtopping of coastal defences) and finally, the receptor is anything which is affected by the flood event (e.g. people, infrastructure, property).

1.3. Causes of Flooding

The Planning System and Flood Risk Management Guidelines requires an FRA to consider all potential causes of flooding including the following:

- Coastal flooding
- Inland flooding
 - Overland flow
 - River flooding
 - Flooding from artificial drainage systems

- Groundwater flooding
- Estuarial flooding
- Failure of infrastructure
- Snow melt

1.4. Assessing Flood Risk

In the context of the 'Planning System and Flood Risk Management Guidelines, DOEHLG, 2009' three flood zones are designated in the consideration of flood risk to a site. The three flood zones are described in Table 1-1 below.

Table 1-1 Flood Zone Description

Flood Zone	Description
Flood 'Zone A'	where the probability of flooding is the highest (greater than 1% or 1 in 100 year for watercourse flooding or 0.5% or 1 in 200 for coastal flooding).
Flood 'Zone B'	where the probability of flooding is moderate (between 0.1% or 1 in 1000 year and 1% or 1 in 100 year for watercourse flooding, and between 0.1% or 1 in 1000 year and 0.5% or 1 in 200 for coastal flooding).
Flood 'Zone C'	where the probability of flooding is low or negligible (less than 0.1% or 1 in 1000 year for both watercourse and coastal flooding). Flood Zone 'C' covers all areas which are not in Zones 'A' or 'B'.

The planning implications for each of the flood zones are:

Zone A - High probability of flooding. Most types of development would be considered inappropriate in this zone. Development in this zone should be avoided and/or only considered in exceptional circumstances, such as in city and town centres, or in the case of essential infrastructure that cannot be located elsewhere, and where the Justification Test has been applied. Only water-compatible development, such as docks and marinas, dockside activities that require a waterside location, amenity open space, outdoor sports and recreation, would be considered appropriate in this zone.

Zone B - Moderate probability of flooding. Highly vulnerable development, such as hospitals, residential care homes, Garda, fire and ambulance stations, dwelling houses and primary strategic transport and utilities infrastructure, would generally be considered inappropriate in this zone, unless the requirements of the Justification Test can be met. Less vulnerable development, such as retail, commercial and industrial uses, sites used for short-let for caravans and camping and secondary strategic transport and utilities infrastructure, and water-compatible development might be considered appropriate in this zone. In general, however, less vulnerable development should only be considered in this zone if adequate lands or sites are not available in Zone C and subject to a flood risk assessment to the appropriate level of detail to demonstrate that flood risk to and from the development can or will adequately be managed.

Zone C - Low probability of flooding. Development in this zone is appropriate from a flood risk perspective (subject to assessment of flood hazard from sources other than rivers and the coast) but would need to meet the normal range of other proper planning and sustainable development considerations

2. Site Description

2.1 Proposed Development and Site Description



Figure 2-1 - Site Location

2.1. Project Description

The proposed development includes the development of 27-units on the site which will include 15 number traveller appropriate houses in Ellis Yard and 12 number traveller appropriate units in Spring Lane.

2.2 Existing Conditions

The existing development site is approximately 4.9 ha and is bounded by Park Court housing estate to the east, the Glen Rovers GAA pitch and the Glenfields housing estate to the north, the Ballyvollane road and Ballyvolane industrial estate to the south and the North Side Business Campus industrial estate to the west. The site is located to the north of the Ballyvolane road on the north side of Cork City, County Cork. There are currently approximately 50 no families resident in the Spring Lane portion of the site while the Ellis Yard section of the site consists of an open concrete yard.

2.3 Topography

The Spring Lane site is an old quarry with slopes from both the north, east and south. There are level changes more than 10m in places on the Spring Lane section of the site. The slope to the south of the site is less than 1:1 in places. The slope to the North is more of a gradual rise to the Glenfields housing estate. The slope to the east has had work carried out to it in the last 2 years where a retaining wall has been introduced to strengthen the embankment in the area. In the Ellis Yard section of the site there is a slope to the south with level changes in excess of 10m in places.

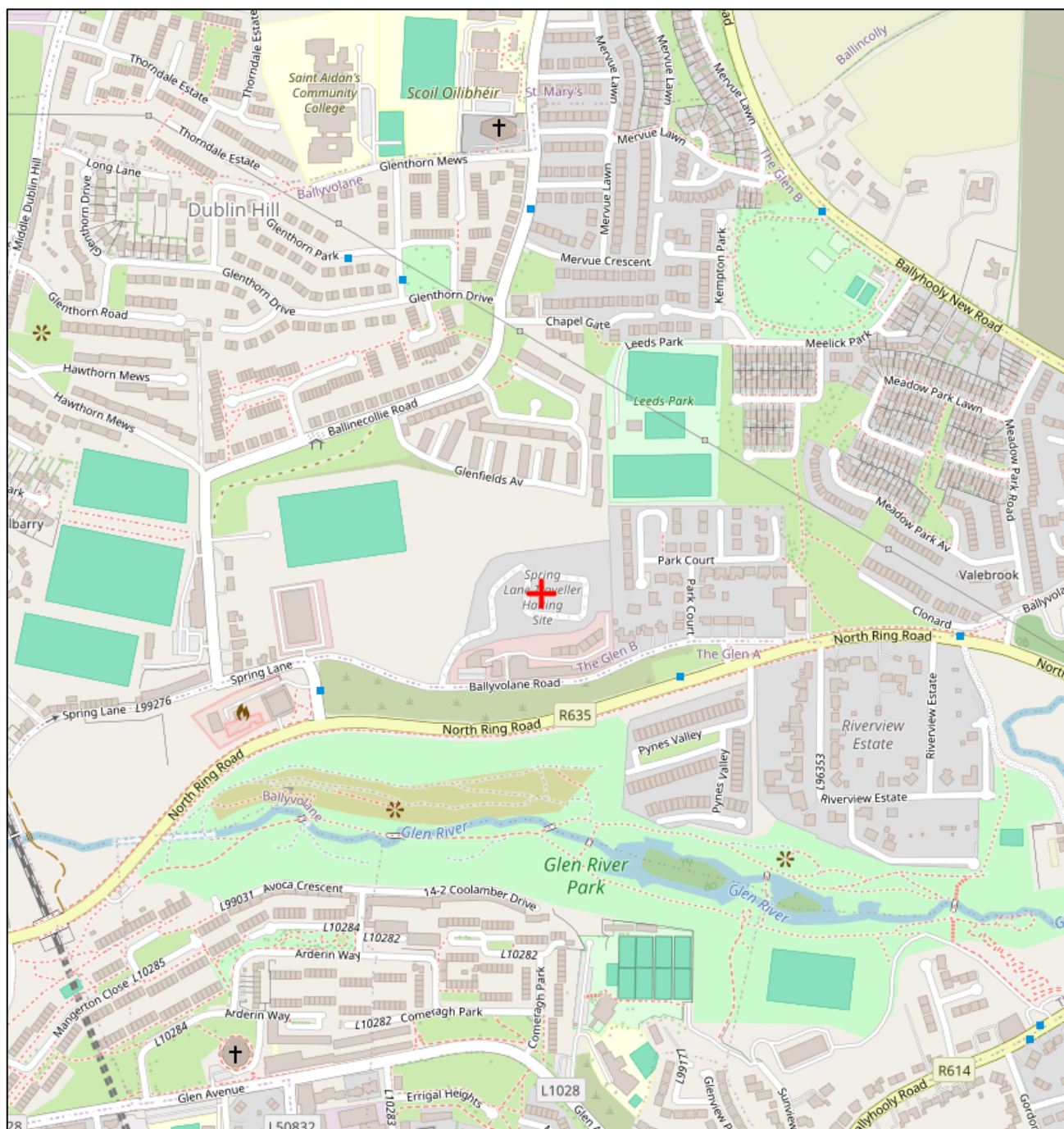
2.4 Local Hydrology and Existing Drainage

EPA maps indicate no existing local hydrology is within proximity of the proposed site.

Accurate detailed GPR surveys are not available at this stage. However, desktop studies have identified stormwater drainage and foul drainage in the vicinity of the site.

Figure 2-2 below shows the local hydrology and surface water features within and surrounding the proposed site, the base map has been extracted from the EPA's GIS application website which is the EPA's interactive map viewer.

Figure 2-2 – Local Hydrology (<https://gis.epa.ie/EPAMaps>)



2.5 Geology

A review of the Geological Survey of Ireland (GSI) online maps has identified that the site extents are underlain by flaser-bedded sandstone & mudstone. There is an extreme groundwater vulnerability in this area.

3. Flood Risk Identification

3.1. Flood Risk Investigation

In accordance with the planning guidelines, a *Stage 1 Flood Risk Identification* is required to be undertaken to identify if there are any flooding or surface water management issues related to the proposed development that may warrant further investigation. Initially, the following possible flood mechanisms for the Spring Lane and Ellis Yard redevelopment project have been identified:

Table 3-1 Possible Flooding Mechanisms

Source/Pathway	Significant	Comment/Reason
Coastal flooding	No	The proposed development is not located in a coastal area.
Overland flow (pluvial)	No	The surrounding area has suitable drainage systems in place to cater lands are relatively shallow. A desktop study has determined that the site extents are underlain by flaser-bedded sandstone & mudstone. Moreover, as the greenfield lands surrounding the site are relatively shallow in topography, the risk of overland flow flooding to the site is deemed to be low.
River flooding (fluvial)	No	No rivers have been identified to pass through the proposed site.
Flooding from artificial drainage systems	No	No existing or historic flooding has been identified on the site.
Groundwater flooding	No	There are no significant springs or groundwater discharges recorded in the immediate vicinity of the site.
Estuarial flooding	No	The proposed development is not located in an estuarial area.
Failure of infrastructure	No	No existing major infrastructure has been identified to fail on site. Proposed future infrastructure on this site will be designed in line with best practice to minimise risk of any flooding event.
Snow melt	No	No historic records of snow melt have been identified as a possible flooding mechanism.

Table 3-1 above demonstrates that the proposed development is not at risk of flooding.

3.1.1 Office of Public Works Flood Maps

The Office of Public Works (OPW) has an interactive map viewer (<http://www.floodinfo.ie/map/floodmaps/>) which displays the predicted flood extents for both rivers and coastal areas over various return periods. The viewer was consulted in relation to this proposed site. Detailed flood maps are available for the proposed site area and the fluvial map specific to the site (M7/UA/EXT/CURS/002) has been included in Appendix A of this report. From review of the detailed Cork City Strategic Flood Risk Assessment Report fluvial map, produced in July 2021, it is evident that there are no areas within the proposed site boundary that are at risk of flooding.

<https://www.floodinfo.ie/>

3.1.2 Cork City Council ‘City Development Plan’

The Cork City Council ‘City Development Plan 2022-2028’ was reviewed, specifically the Strategic Flood Risk Assessment (SFRA) which was produced in October 2022 by CAAS Ltd.

The report provides flood mapping within the Appendices and from review there is no risk of fluvial, pluvial, or surface water flooding. It also highlights no historic ground water flooding.

<https://www.corkcity.ie/en/proposed-cork-city-development-plan-2022-2028/draft-plan-documents/phase-2-draft-development-plan-2022-2028/strategic-flood-risk-assessment/flood-mapping-appendix-ii-flood-risk-assessment.html>

3.1.3 OPW Flood Hazard Website

The OPW Flood Hazard Mapping website (<http://www.floodmaps.ie>) was consulted in relation to available historical or anecdotal information on any flooding incidences or occurrences in the vicinity of the proposed development. From review of the flood maps it can be seen that no flooding incidences were recorded in the past.

3.1.4 OPW/EPA/Local Authority Hydrometric Data

The OPW, EPA and Local Authority hydrometric data stations were reviewed on the EPA HydroNet website. The review confirmed that there are no registered hydrometric stations in the vicinity of the proposed site.

<https://opw.hydronet.com/default.aspx?page=6&appid=169&lang=2>

3.1.5 Ordnance Survey Historic Mapping

The GeoHive map viewer (<http://map.geohive.ie/mapviewer.html>) was consulted to review available historic mapping for the proposed scheme which can contain evidence of historical flooding incidences or occurrences. The maps consulted were the pre-1900’s historic 6-inch colour and 25-inch maps. The flood maps layer was also consulted to identify any potential flood plains within the environs of the site. The review confirmed that there is no flood extents information contained within the viewer for the proposed site.

3.2 Potential Receptors

A receptor of flooding can include people, their property, and the environment. The vulnerability of a potential receptor must be identified and reviewed for all sites which are at risk of flooding.

In accordance with the planning guidelines, it is deemed that the proposed Ellis Yard and Spring Lane development should be classified as “Highly Vulnerable Development”.

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.

Figure 3-1 – Table 3.1 Classification of Vulnerability Class (Planning System Flood Risk Management Guidelines for Planning Authorities, 2009)

3.3 Conclusion of Flood Risk Identification

The purpose of the Stage 1 Flood Risk Identification process is to establish whether a flood risk issue currently exists or may exist in the future. If a potential flood risk issue is identified the risk will be investigated in further detail by undertaking a Stage 2 – Initial Flood Risk Assessment. However, if no potential flood risk is identified then the overall assessment can conclude at this point.

In relation to the Spring Lane and Ellis Yard redevelopment, based on the Stage 1 - Flood Risk Identification findings discussed above, the flood risk study has identified that the proposed site is not at risk from flooding from any of the sources discussed in Table 3-1.

As a result, it is concluded that a Stage 2 – Initial Flood Risk Assessment is not deemed necessary.

4. Conclusions and Recommendations

4.1. Conclusions

A Stage 1 Flood Risk Assessment has been completed in accordance with ‘The Planning System and Flood Risk Management – Guidelines for Planning Authorities’ DOEHLG November 2009, for the proposed Ellis Yard and Spring Lane redevelopment. Based on the foregoing assessment, the following conclusions are made;

- No existing streams or rivers pose a flood risk to areas of the proposed development site.
- The CFRAMS Map indicate the development is located in Flood Zone C with the probability of flooding at less than 1 in 1000 or 0.1%, Flood Zone C covers all other areas that are not in Flood Zones A or B and is the lowest risk category.
- The type of development is defined as ‘Highly Vulnerable Development’. Using the sequential approach mechanism, it is assessed that a justification test is not required for the proposed development.
- A Stage 2 Flood Risk Assessment is not deemed necessary for the proposed site.

Due to the site being located in a low risk flood area, it is considered ‘Appropriate’ to locate a “Highly Vulnerable Development” within the Flood Zone C.

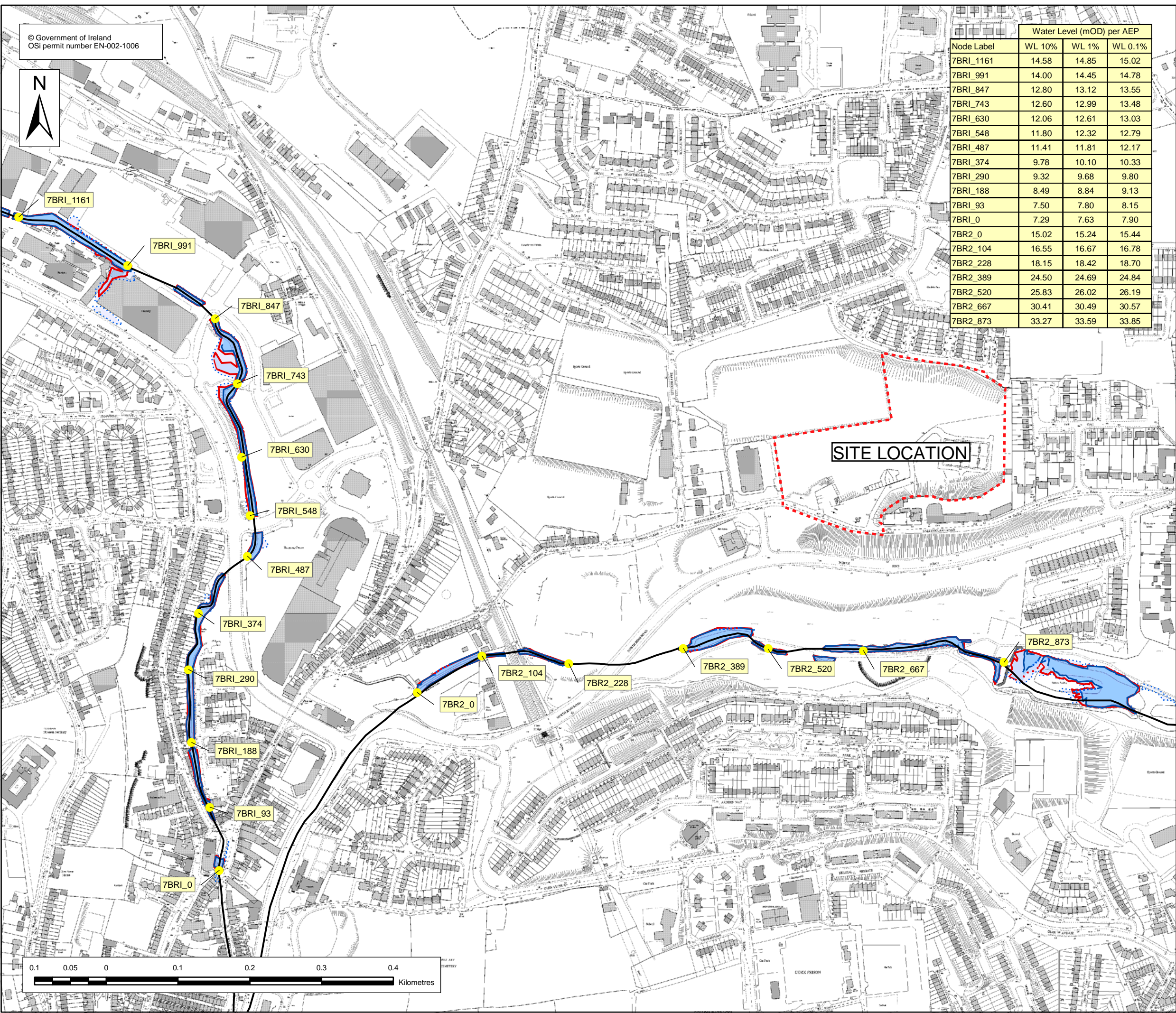
	Flood Zone A	Flood Zone B	Flood Zone C
Highly vulnerable development (including essential infrastructure)	Justification Test	Justification Test	Appropriate
Less vulnerable development	Justification Test	Appropriate	Appropriate
Water-compatible development	Appropriate	Appropriate	Appropriate

Figure 4-1 – Table 3.2 Matrix of Vulnerability vs Flood Zone (Planning System Flood Risk Management Guidelines for Planning Authorities, 2009)

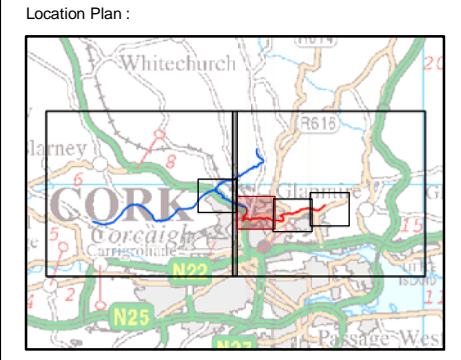
Appendices



Appendix A. FEM FRAM Map



Node Label	Water Level (mOD) per AEP		
	WL 10%	WL 1%	WL 0.1%
7BRI_1161	14.58	14.85	15.02
7BRI_991	14.00	14.45	14.78
7BRI_847	12.80	13.12	13.55
7BRI_743	12.60	12.99	13.48
7BRI_630	12.06	12.61	13.03
7BRI_548	11.80	12.32	12.79
7BRI_487	11.41	11.81	12.17
7BRI_374	9.78	10.10	10.33
7BRI_290	9.32	9.68	9.80
7BRI_188	8.49	8.84	9.13
7BRI_93	7.50	7.80	8.15
7BRI_0	7.29	7.63	7.90
7BR2_0	15.02	15.24	15.44
7BR2_104	16.55	16.67	16.78
7BR2_228	18.15	18.42	18.70
7BR2_389	24.50	24.69	24.84
7BR2_520	25.83	26.02	26.19
7BR2_667	30.41	30.49	30.57
7BR2_873	33.27	33.59	33.85



EXTENT MAP

Legend:

- 10 % AEP Flood Extent (1 in 10 chance in any given year)
- 1 % AEP Flood Extent (1 in 100 chance in any given year)
- 0.1 % AEP Flood Extent (1 in 1000 chance in any given year)
- High Confidence (<20m) (10% AEP)
- Medium Confidence (<40m) (10% AEP)
- Low Confidence (>40m) (10% and 0.1% AEP)
- High Confidence (<20m) (1% AEP)
- Medium Confidence (<40m) (1% AEP)
- Low Confidence (>40m) (1% AEP)
- River Centreline
- Node Point
- 7BR2_3160 Node Label (refer to table)

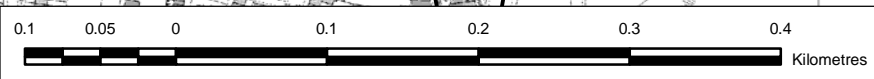
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Project : LEE CATCHMENT FLOOD RISK ASSESSMENT AND MANAGEMENT STUDY	
Map : CORK CITY NORTH	
Map Type : FLOOD EXTENT	Source : FLUVIAL FLOODING
Map area : URBAN AREA	Scenario : CURRENT
Figure By : Valeria Medina	Date : 21 June 2012
Checked By : Paul Dunne	Date : 21 June 2012
Approved By : Clare Dewar	Date : 21 June 2012
Figure No. : M7/UA/EXT/CURS/002	Revision 1
Drawing Scale : 1:5,000	Plot Scale : 1:1 @ A3



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