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FLOOD RISK ASSESSMENT

Project : Development at
Lodge Park,
Straffan,
Co. Kildare

Client : Mark Murray

Date : 18th May 2022

Report By : Emmet Furey

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INTRODUCTION

1.1 Proposed Development Details

Conor Furey & Associates Ltd. have been appointed by Mark Murray to prepare a Flood Risk Assessment (FRA) for zoning submission for development at Lodge Park, Straffan, Co. Kildare. The flood risk assessment is to establish the level of flood risk at the site and to examine the impact that potential development could have on the receiving environment and then to propose mitigation measures to be taken in the case that there could be any impact on the proposed development and the receiving environment.

1.2 Site Location

The site is located off the L1011, Straffan and is served by an existing private roadway to the east of the site and currently is in use as an access roadway to a public foul pumping station. The site is located 415m to the north of the River Liffey and is drained to the River Liffey via a series of drainage ditches.

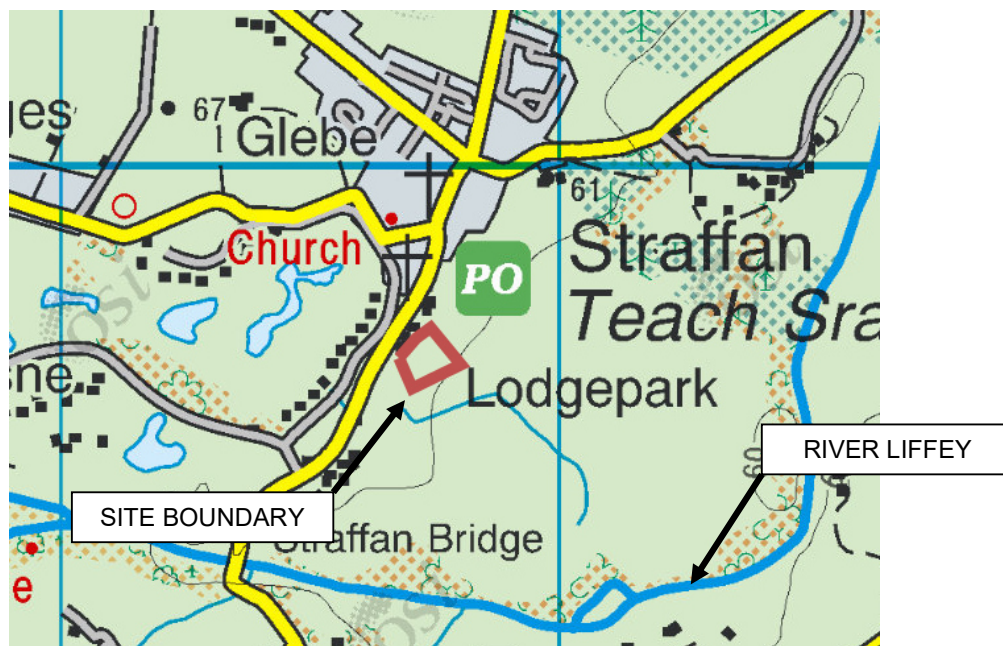


Fig 1.1 – Site Location

1.3 General Terms of Reference

The aim of the FRA is to identify, quantify and communicate to decision makers and other stakeholders the risk of flooding associated with the proposed development. The purpose of this FRA is to confirm the suitability of the site for the proposed development.

The FRA has been carried out in accordance with “The Planning System and Flood Risk Management Guidelines” (hereafter referred to as the FRM Guidelines) published in November 2009 jointly by the then Department of the Environment, Heritage and Local Government, DEHLG (now the Department of the Environment, Community and Local Government, DECLG) and the Office of Public Works (OPW).

The following reports have been referred to in compiling this FRA.

- CFRAMS mapping
- OPW / Dublin City Pluvial Flood Depth Map
- GSI ground water mapping
- GSI soil mapping
- MyPlan flood risk mapping

FLOOD RISK ASSESSMENT METHODOLOGY

2.1 Methodology used for FRA of the proposed site

The methodology used for the flood risk assessment for the proposed development is based on “The Planning System and Flood Risk Management Guidelines for Planning Authorities (2009)”. The FRM Guidelines require the planning system at national, regional and local levels to:

- Avoid development in areas at risk of flooding, particularly floodplains, unless there are proved wider sustainability grounds that justify appropriated development.
- Adopt a sequential approach to flood risk management when assessing the location for new development based on avoidance, reduction and then mitigation of flood risk and
- Incorporate flood risk assessment into the process of making decisions on planning applications and planning appeals.

The Sequential Approach in Flood Risk Management requires the following three steps to identify the necessity for the justification test for a development.

- Step 1 Identification of the Flood Zone at the proposed development site (Section 2.23 of the FRM Guidelines).
- Step 2 Identification of the vulnerability of the type of the proposed development.
- Step 3 Using the matrix of vulnerability versus Flood Zone (Table 3.2 of the FRM Guidelines), identify the necessity for the justification for the proposed development.

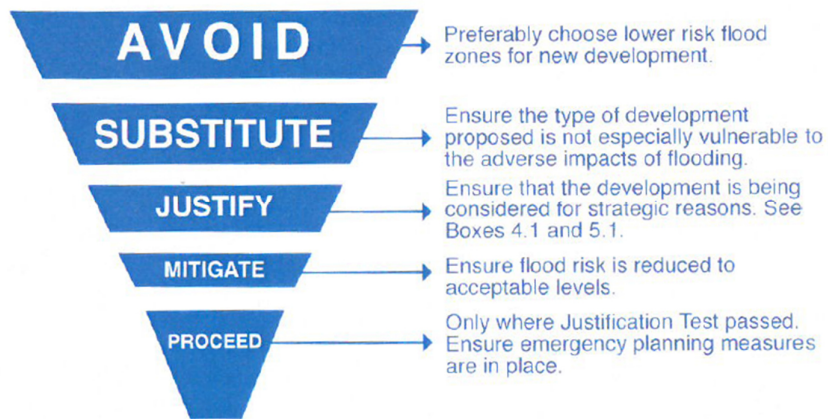


Fig. 2.1 - Sequential approach principles in flood risk management

While the FRM Guidelines sets out the broad philosophy underpinning the sequential approach in the Flood Risk Management, the Flood Risk Guidelines (shown below) shows the mechanism of the sequential approach for use in the planning process. See figure 2.2 below.

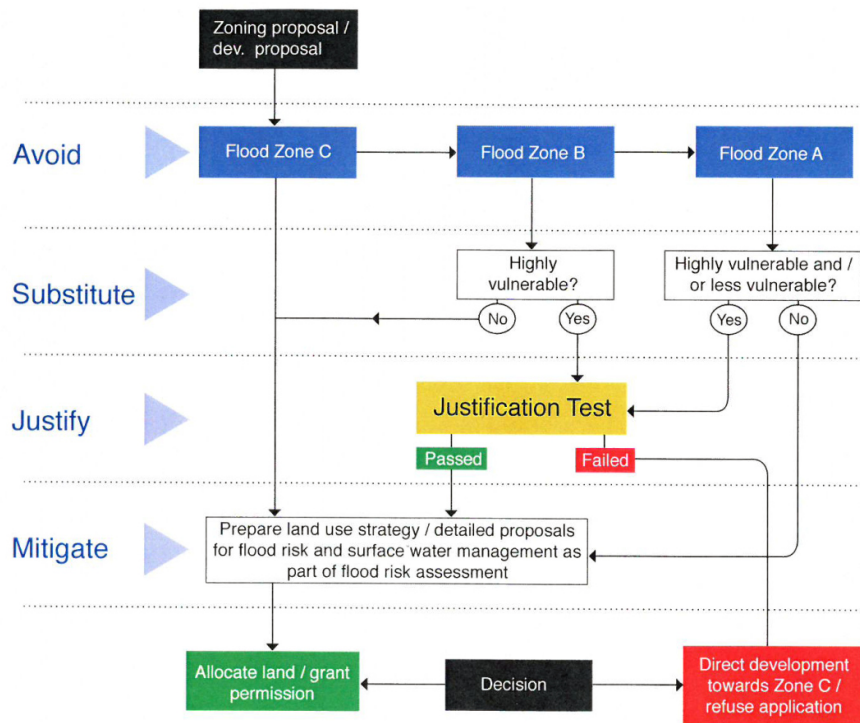


Fig. 2.2 - Sequential approach mechanism in the planning process

According to the FRM Guidelines, Flood Zones are graphical areas within which the likelihood of flooding is in a particular range. 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 Flood Zones, namely;

Flood Zone A Where the probability of flooding from rivers and the sea is highest (greater than 1% of in 1 in 100 year 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 100 year and 1% or 1 in 1000 year for river flooding and between 0.1% or 1 in 1000 year and 0.5% or 1 in 200 year 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 for both river and coastal flooding).

Flood Zones A, B, and C are based on the current assessment of the 1% and the 0.1% fluvial events and the 0.5% and 0.1% tidal events, without the inclusion of climate change factors. Table 2.3 of the FRM Guidelines shows the vulnerability to flooding of different types of development.

Vulnerability class	Land uses and types of development which include*
Highly vulnerable development (including essential infrastructure)	<p>Garda, ambulance and fire stations and command centres required to be operational during flooding;</p> <p>Hospitals;</p> <p>Emergency access and egress points;</p> <p>Schools;</p> <p>Dwelling houses, student halls of residence and hostels;</p> <p>Residential institutions such as residential care homes, children's homes and social services homes;</p> <p>Caravans and mobile home parks;</p> <p>Dwelling houses designed, constructed or adapted for the elderly or, other people with impaired mobility; and</p> <p>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.</p>
Less vulnerable development	<p>Buildings used for: retail, leisure, warehousing, commercial, industrial and non-residential institutions;</p> <p>Land and buildings used for holiday or short-let caravans and camping, subject to specific warning and evacuation plans;</p> <p>Land and buildings used for agriculture and forestry;</p> <p>Waste treatment (except landfill and hazardous waste);</p> <p>Mineral working and processing; and</p> <p>Local transport infrastructure.</p>
Water-compatible development	<p>Flood control infrastructure;</p> <p>Docks, marinas and wharves;</p> <p>Navigation facilities;</p> <p>Ship building, repairing and dismantling, dockside ash processing and refrigeration and compatible activities requiring a waterside location;</p> <p>Water-based recreation and tourism (excluding sleeping accommodation);</p> <p>Lifeguard and coastguard stations;</p> <p>Amenity open space, outdoor sports and recreation and essential facilities such as changing rooms; and</p> <p>Essential ancillary sleeping or residential accommodation for staff required by uses in this category (subject to a specific warning and evacuation plan).</p>

*Uses not listed here should be considered on their own merits

Table 2.1 - Vulnerability to flooding (FRM Guidelines)

Table 2.4 of the FRM Guidelines illustrates those types of development that would be appropriate to each flood zone and those that would be required to meet the Justification Test.

	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

Table 2.2 - Vulnerability of development (FRM Guidelines)

Matrix of vulnerability versus flood zone to illustrate appropriate development and that required to meet the Justification Test.

The FRM Guidelines outlines the following three stages of flood risk assessment:

Stage 1: Flood Risk Identification

To identify whether there may be flooding or surface water management issues relating to the proposed development site that may warrant further investigations.

Stage 2: Initial Flood Risk Assessment

To confirm sources of flooding that may affect the proposed development site, to appraise the adequacy of existing information and to determine what surveys and modelling approach is appropriate to match the spatial resolution required and complexity of the flood risk issues. This stage involves the review of existing studies and hydraulic modelling to assess flood risk and to assist with the development of FRM measures.

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, of its potential impacts on flood risk elsewhere and of the effectiveness of any proposed mitigation measures. This will typically involve use of an existing or construction of a hydraulic model across a wide enough area to appreciate the catchment wide impacts and hydrological process involved.

2.2 Data Collection

Data required for the flood risk assessment was obtained from various sources as described below:

- The historic flood data was obtained from the National Flood Hazard Mapping website – www.floodmaps.ie (See Appendix A)
- The Subsoil and Aquifer vulnerability data was obtained from the Geological Survey of Ireland – www.gsi.ie
- Office of Public Works – www.opw.ie
- Dublin City Pluvial Flood Level Map.

2.3 The Justification Test

The justification test is designed to rigorously assess the appropriateness or otherwise of particular developments that, for various reasons, are being considered in an area of moderate or high flood risk (JUSTIFICATION). The Plan-Making Justification Test is relevant to a strategic flood risk assessment for plans and is described as follows.

Where, as part of the preparation and adoption or variation and amendment to a development/local area plan, a Planning Authority is considering the future development of areas in an urban settlement that are at moderate or high risk of flooding, for uses or development vulnerable to flooding that would generally be appropriate as set out in Table 2.2 above, all the following criteria must be satisfied.

1. The urban settlement is targeted for growth under National Spatial Strategy, Regional Planning Guidelines and Statutory Plans as defined above or under the Planning Guidelines or Planning Directives provisions of the Planning and Development Act.
2. The zoning or designation of the lands of the particular use or development type is required to achieve the proper planning and sustainable development of the urban settlement.
3. A flood risk assessment to an appropriate level of detail has been carried out as part of the Strategic Environment Assessment as part of the development plan preparation process, which demonstrates that the flood risk to the development can be adequately managed and the use or development of the lands will not cause unacceptable adverse impacts elsewhere.

EXISTING HYDROLOGICAL ENVIRONMENT

3.1 Salient Hydrological Features

The site is located on a greenfield site to the south of Straffan Village and lies approximately 415m from the River Liffey. The site is separated from the river by agricultural lands and is connected to the River Liffey via a series of drainage channels. The drainage channel located at the south-eastern corner of the site is shown to flood in the 1% AEP flood event. The site itself is situated at a higher elevation than the drainage channel and as such falls outside of the area identified below.

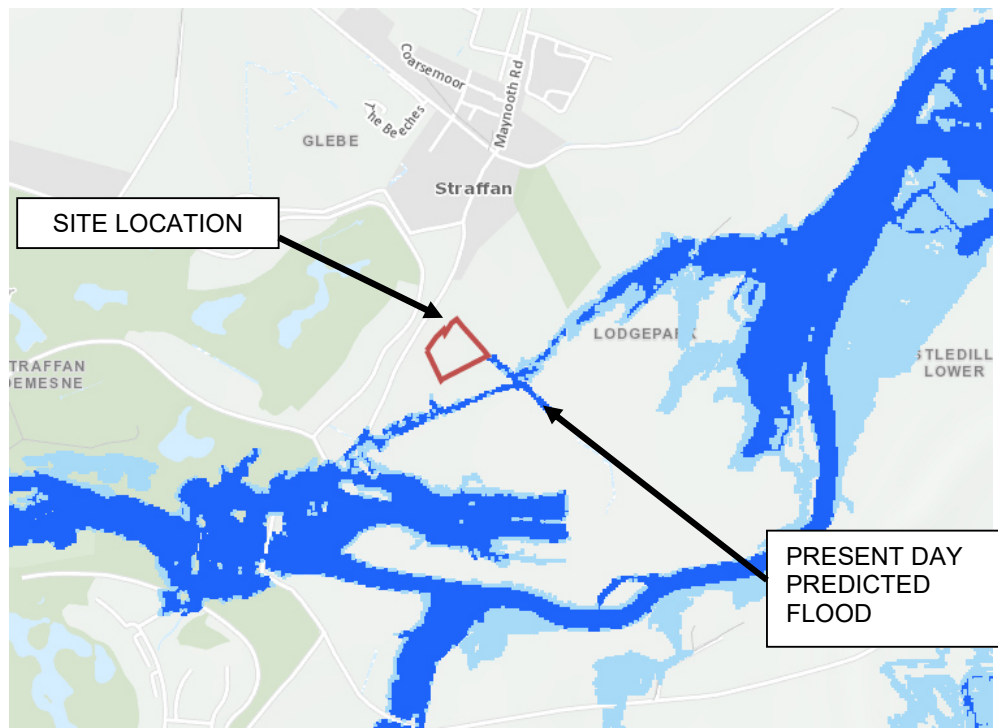


Fig 3.1 – OPW Flood Mapping (www.myplan.ie)

3.2 Existing Drainage

The application site consists of a relatively flat greenfield site adjacent to established residential development. The greenfield site contains no existing structures and slopes very gradually to the southern boundary. Surface water run-off to the greenfield site would generally be towards the existing drainage channel to the south of the site which connects to the River Liffey further downstream. There is an existing storm sewer located to the east of the site at circa 1.0m bgl.

3.3 Existing Geology and Hydrogeology of Area

The geological Survey of Ireland (GSI) website provides information on their public online mapping service at www.gsi.ie on subsoil and aquifer vulnerability. The site maps for the Development are presented in Figures 3.2 & 3.3.

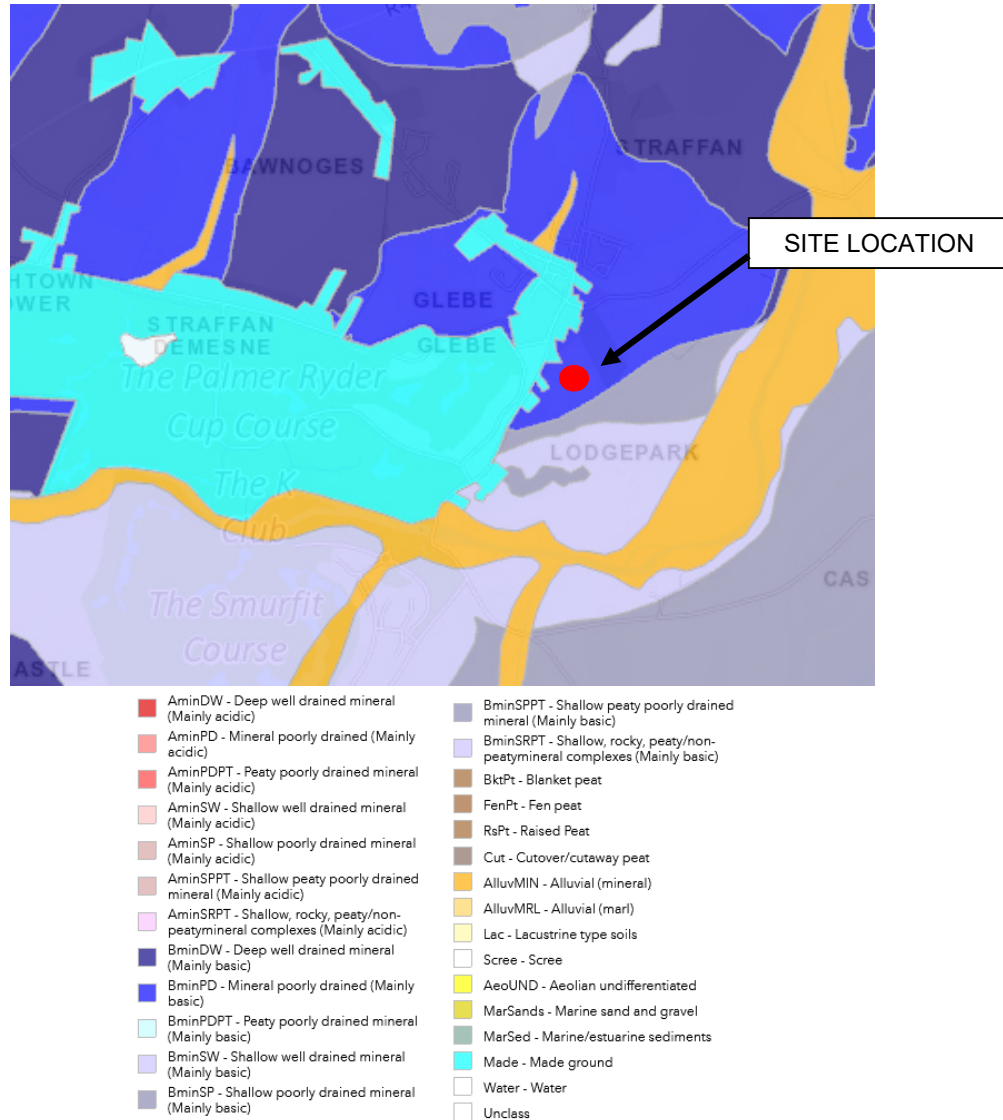


Fig. 3.2 - Teagasc Sub-Soil Map



Fig. 3.3 - Groundwater Vulnerability Map

Based on the GSI mapping above in figures 3.2 and 3.3, the sub-soil of the subject site is primarily limestone till. The vulnerability map indicates that the site is classified as moderate vulnerability and therefore ground water discharge is possible.

3.4 Existing Flood Regime in the Area

The OPW and CFRAMS mapping have identified no flood risk to the site. See below in figure 3.4 the 0.1% AEP flood event mapping for fluvial flooding as identified in the latest CFRAMS mapping. The below map identifies the current day 1:1000 year flood level. Any proposed development on the subject site would be sited such that FFLs are minimum 0.5m above the maximum flood level identified. The site also lies outside the influence of projected coastal flooding. All pluvial flooding will be dealt with by way of appropriately designed and managed SuDS features which will be subject to future design.

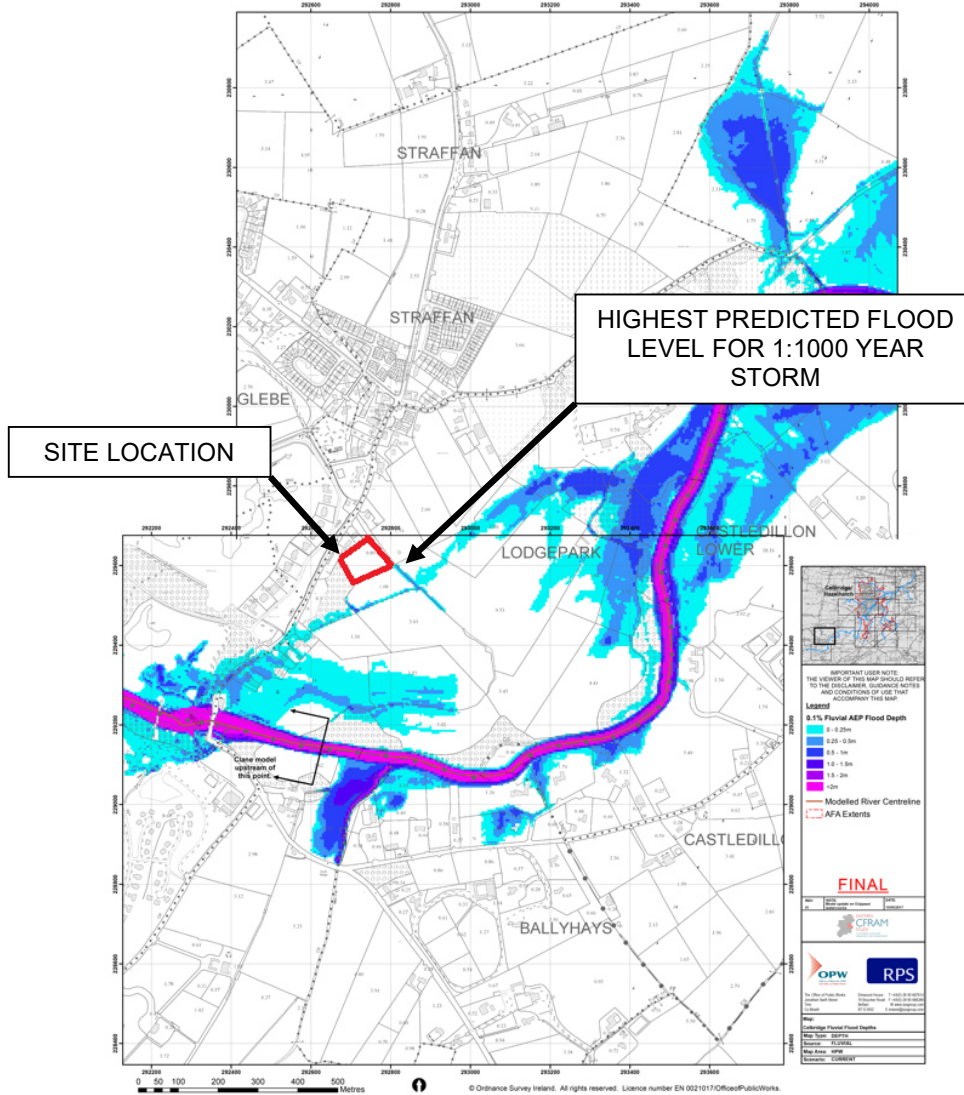


Fig. 3.4 – CFRAMS 0.1% AEP Mapping

3.5 Preliminary Flood Risk Assessment

It can now be established that the site does not lie in any identified flood risk area. The ground water mapping indicated moderate vulnerability to the ground water and any future development would consist of proposals to discharge all surface water from hard areas through interceptors and into the surface water sewer system to remove any possible impact on the ground water.

3.6 Flood Alleviation Measures Report

NIL.

CONCLUSION & RECOMMENDATIONS

4.1 General Discussion

The likelihood of flooding is defined in the Guidelines as follows:

“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. “

As outlined in Section 2 of this report the FRM guidelines identifies three stages of Flood Risk Assessment namely:

- Stage 1 : Flood Risk Identification
- Stage 2: Initial Flood Risk Assessment
- Stage 3: Detailed Flood Risk Assessment

4.2 Stage 1: Flood Risk Identification

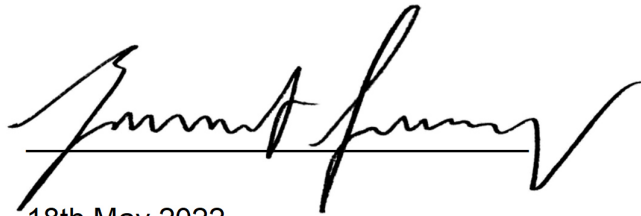
According to the FRM guidelines, flood risk identification is the process for deciding whether a plan or project requires further investigation. In the case of the proposed development no further action is now required.

4.3 Summary of Results

The purpose of the Flood Risk Analysis has established that there is no identifiable risk to flooding at the proposed development site.

4.4 Signature

Signed :



Date :

18th May 2022

Print Name :

Emmet Furey

Qualifications :

B.E. (Structural), Chartered Engineer, M.I.E.I.

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