McCloy Consulting

Flood Risk Assessment

Ballymastone Recreational Hub, Donabate, Co. Dublin

M02127-05_DG01 | June 2021

WATER & ENVIRONMENTAL CONSULTANTS

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DISTRIBUTION

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Kevin Halpenny, Fingal CC	✓	✓				

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CONTENTS

LIST OF TABLES

LIST OF FIGURES

APPENDICES

1 INTRODUCTION

1.1 Terms of Reference

This Stage 1 Flood Risk Assessment report was commissioned by Fingal County Council to assess the potential risk of flooding at Ballymastone Recreational Hub, Donabate, Co. Dublin (hereafter referred to as 'the site').

1.2 Statement of Authority

This report and assessment has been prepared and reviewed by qualified professionals with appropriate experience in the fields of flood risk, drainage, wastewater, and hydraulic modelling studies. The key staff members involved in this project are as follows:

- Duncan Hartwick *BEng (Hons) BSc (Hons) MIEI* – Project Engineer with experience in flood risk assessment, hydrogeology, and surface water drainage.
- Paul Singleton *BEng (Hons) MSc CEng MIEI* – Chartered Civil / Environmental Engineer with particular experience in drainage, SuDS and flood risk assessment, and a recognised industry professional having given industry training in these fields in Ireland and the UK.
- Kyle Somerville *BEng (Hons) CEng MIEI* – Associate and Chartered Engineer specialising in the fields of flood risk assessment, flood modelling, drainage, and surface water management design for public and private sectors.

1.3 Purpose

This assessment is intended to produce a screening FRA to ensure that all relevant issues related to flooding are identified. This Stage 1 FRA will assess whether there are any flooding and / or surface water management issues at and surrounding the site.

The assessment will therefore determine potential sources of flooding at the site and outline recommended mitigation and further work where necessary / appropriate.

1.4 Approach to the Assessment

Consideration has been given to the sources and extent of all potential sources of flooding at the site, including fluvial, coastal, pluvial, urban drainage and groundwater flooding.

The method of assessment applied complies with the Source-Pathway-Receptor model and provides a spatial assessment of flood risk to people, property, and the environment at the site. Existing runoff characteristics and the risk of flooding from surface water drainage are also considered.

1.4.1 Hydraulic Model Status

For the purposes of this assessment, the primary stakeholders are the Office of Public Works (OPW) and Fingal County Council (FCC). OPW and FCC data has been used to form the basis of this assessment and is presented in line with the relevant guidance and requirements.

The site and surrounding area are included in the Preliminary Flood Risk Assessment (PFRA), which was the first phase of the OPW's CFRAM Programme, as well as the more detailed FEM FRAMS flood mapping. Both sets of flood maps are referred to later in this assessment.

1.4.2 Planning Guidelines

The requirements for Flood Risk Assessments are generally as set out in the OPW's The Planning System and Flood Risk Management – Guidelines for Planning Authorities, 2009 (hereafter referred to as the 'OPW Guidelines') and accompanying Technical Appendices. Further guidance is provided in the OPW's Climate Change Sectoral Adaptation Plan, 2019, and CIRIA Research Project 624 Development and Flood Risk – Guidance for the Construction Industry, 2004.

Planning guidelines applicable to the area of interest are implemented in the Fingal Development Plan 2017-2023, specifically through the Strategic Flood Risk Assessment for the Fingal Development Plan 2017-2023 (hereafter referred to as "the SFRA").

The SFRA was prepared in accordance with the requirements of the OPW Guidelines and adopts an identical Flood Zone standard. Flood Zones are the extents of a design flood event that determine whether development is appropriate from a flood risk point of view. They are defined in both the OPW Guidelines and SFRA as follows:

- 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).
- 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).

The SFRA clarifies that Flood Zones are to be used to determine suitability of proposed development and are to be derived from 'present day' hydrological estimates. The SFRA also states that Flood Zones are generated without the inclusion of climate change and that in addition to flood zoning, developments should be designed to be resilient to the effects of climate changes.

The OPW Guidelines state that the purpose of Stage 1: Flood Risk Identification is "*to identify whether there may be any flooding or surface water management issues relating to a plan area or proposed development site that may warrant further investigation*". If a Stage 1 FRA identifies potential flood risk issues at the site, a Stage 2 and / or Stage 3 FRA is recommended and should be carried out. If no potential flood risk is identified, the process can end at Stage 1.

2 DEVELOPMENT AND SITE DETAILS

2.1 Site Location

Figure 2.1 Location Context

Figure 2.2: Site Location

2.2 Site Description

The site is located approximately 1.3 km east of Donabate, Co. Dublin. Existing site characteristics are as follows:

- Greenfield land including existing sports pitches
- Site levels fall generally from north-west to south-east and range from approximately 9.5 to 7.4 metres Ordnance Datum (mOD)

2.3 Development Proposals

The proposed development that this assessment is intended to support is described as follows:

- A Third Generation GAA-sized / 2 no. soccer-sized all-weather multi-functional sports pitch/es with a playing surface of 150 m x 106 m or 16,024 m^2
- An 8 lane 400 m all-weather running track (set around a grass pitch/field sports area) with a synthetic track surface area of 9,118 m^2 (grass pitch/field sports area of 6400 m^2)
- 16 no. 15 m high LED floodlights to light both the running track and sports pitch/es to a minimum of 500 lux
- A junior playground (suitable for children under 6 years of age) approx. area 500 m^2
- A combined senior playground (suitable for children between the ages of 6 and 12) and skatepark approx. area 1400 m^2
- A new access road approx. 421 m in length linking the facilities to the newly constructed Donabate Distributor Road
- 200 no. car parking spaces with 20 reserved for people with special needs located beside the facility
- A 2.2 m high perimeter fence surrounding the all-weather facilities
- 3 no. covered viewing stands each 20 m x 10 m in size
- Approx. 1,900 m of 2.5 m wide bound surfaced paths to service the new facilities
- Earthen berms incorporating the excavated material from the construction of the pitch and running track located within the development site will be graded to complement the landscape setting of the facilities
- Drainage from the facility will be fully attenuated within the curtilage of the development site – in relation to both the car park and the synthetic pitches, the attenuation will be provided underneath these facilities

Relevant location and proposed layout drawings are included in Appendix A.

2.4 Vulnerability Classification

The proposed development comprises open amenity space and outdoor sports, recreation, and associated essential (e.g., changing room) facilities with vulnerability classification (per the classification criteria provided in Table 2.1 of the OPW Guidelines) as follows:

Table 2.1: Vulnerability Classification

Part	Use	Classification
Access Road	Local Transport Infrastructure	Less Vulnerable
Outdoor sports, recreation, and associated facilities	Open Amenity Space	Water-Compatible Development

3 BACKGROUND INFORMATION REVIEW

As part of the data collection phase for this assessment, several available sources of information generally as set out in the OPW Guidelines were investigated to build an understanding of the potential risk of flooding to the site. The following review highlights the key findings of the background information review.

3.1 Fingal Development Plan 2017-2023

The Fingal Development Plan 2017-2023 has been reviewed as part of this assessment and the following objectives are considered pertinent to this Stage 1 FRA:

- Objective GI30 – Ensure the provision of new green infrastructure addresses the requirements of functional flood storage, the sustainable management of coastal erosion, and links with provision for biodiversity, Sustainable Drainage Systems (SuDS) and provision for parks and open space wherever possible and appropriate.
- Objective GI31 – Seek the creation of new wetlands and/or enhancement of existing wetlands through provision for Sustainable Drainage Systems (SuDS).
- Objective GI32 – Seek the provision of green roofs and green walls as an integrated part of SuDS and which provide benefits for biodiversity, wherever possible.

3.1.1 Strategic Flood Risk Assessment for the Fingal Development Plan 2017-2023

The SFRA for the Fingal Development Plan 2017-2023 outlines the following relevant guidance:

- Existing flood mapping, including OPW PFRA maps, are considered appropriate for use as a strategic overview of flood risk within the county (i.e., in most cases, not suitable for site-specific applications).
- Flood Zones (as outlined in Section 1.4.2) are generated without the inclusion of climate change factors and should ignore flood defences.
- A precautionary approach to climate change includes recommendations to ensure that levels of structures designed to protect against flooding (such as flood defences or raised floor levels) are sufficient to cope with the effects of climate change over the lifetime of the development.
- The minimum finished floor level (FFL) for highly vulnerable development should be above the Flood Zone B level plus suitable freeboard, whereby the recommended level of freeboard is 500 mm over and above the adjacent Flood Zone B fluvial flood level.
- The minimum FFL for less vulnerable development should be above the Flood Zone A level plus suitable freeboard, whereby the recommended level of freeboard is 500 mm over and above the adjacent Flood Zone A fluvial flood level.

3.2 OPW Flood Hazard and Risk Maps

The Office of Public Works have developed Flood Maps as part of the Catchment Flood Risk Assessment and Management (CFRAM) Programme. As part of the CFRAM programme and to establish the approach for implementing the Floods Directive in Ireland, the OPW in conjunction with other parties commissioned a number of pilot studies.

One such pilot study was the Fingal East Meath Flood Risk Assessment and Management Study (FEM FRAMS), undertaken by Fingal County Council in partnership with Meath County Council and the OPW. The study was carried out in response to investigate the high levels of existing flood risk in the Fingal East Meath area.

The FEM FRAMS flood study involved the production of flood maps for each study area. One such study area was 'Donabate' and the associated flood maps are available through the OPW online viewer (floodinfo.ie). An extract from the above referenced Flood Map is shown in Figure 3.1 and demonstrates that the site is not at risk of flooding. A copy of the original Flood Map is included in Appendix B.

OPW Preliminary Flood Risk Assessment (PFRA), the first stage of the CFRAM process covering all possible sources of flooding, includes risk of flooding from surface water. The PFRA maps is a preliminary assessment based on available or readily derivable information but in the absence of more detailed data,

has been used to inform an assessment of pluvial flooding at the site. The PFRA indicative flood mapping indicates that the site is not at risk of flooding from any source. It should however be noted that the PFRA mapping is considered coarse and the analysis purely indicative.

An extract from the above referenced flood mapping is shown in Figure 3.2. A copy of the original PFRA map is included in Appendix B.

Figure 3.1: OPW FEM FRAMS Flood Map

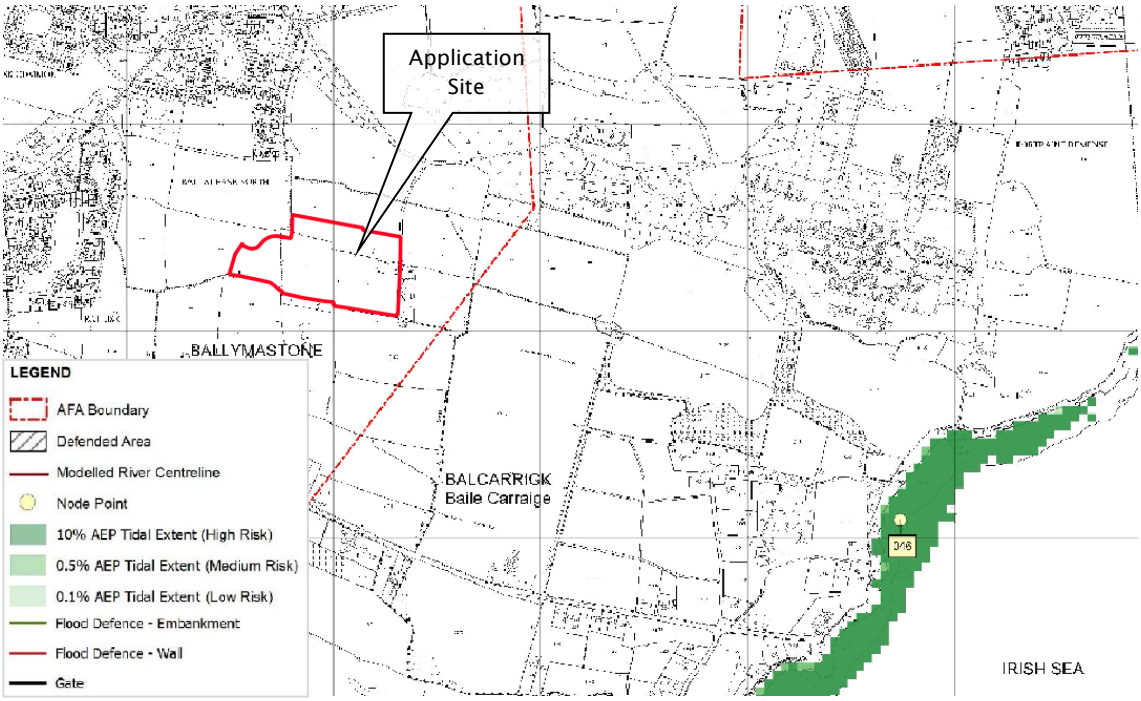
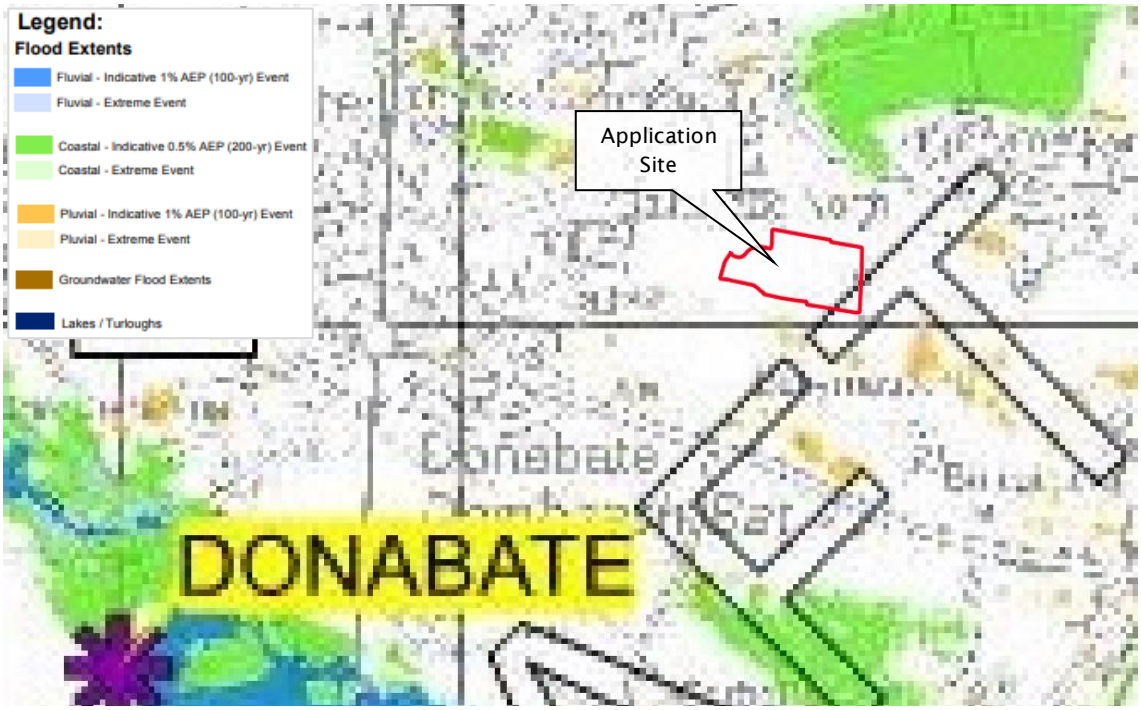


Figure 3.2: OPW PFRA Flood Map



3.3 OPW Past Flood Events

OPW 'Past Flood Event' mapping (available through floodmaps.ie) indicates no records of historic flooding in the vicinity of the site.

3.4 Internet / Media Background Search

An internet / media search found no evidence of flooding at or in the vicinity of the site.

3.5 Drainage Setting

Given the rural / semi-rural site setting, potential for significant formal drainage networks serving the site or its environs is unlikely and asset information has not been sought from relevant stakeholders (local authority / Irish Water).

4 ASSESSMENT OF FLOOD MECHANISMS

4.1 Preamble

Development control procedures advise against inappropriate development in areas at risk of flooding and aim to avoid new development that increases flood risk elsewhere, in accordance with the OPW Guidelines.

The following assessment determines the flood hazards to life and property at the site in order to subsequently assess the site relative to the OPW Guidelines.

4.2 Initial Assessment

Table 4.1 presents a screening assessment of the site for potential flooding mechanisms requiring further detailed assessment. It is based on the background information review and consultations.

Table 4.1: Possible Flooding Mechanisms

Source/Pathway	Significant?	Reason
Fluvial Flooding	No	OPW flood mapping indicates that the site is not in an area at risk of fluvial flooding. No watercourses considered as part of OPW flood mapping exist in the vicinity of the site.
Coastal / Tidal Flooding	No	OPW flood mapping indicates that the site is not in an area at risk of coastal flooding.
Urban Drainage	No	The site is rural / semi-rural, and the likelihood of significant drainage assets is low. Overland flooding from drainage networks would tend to follow flow routes indicated by pluvial flood mapping, which indicates the site is unaffected.
Surface Water Flooding	Possible	OPW PFRA flood mapping indicates that the site is not in an area at risk of surface water flooding. The site is at a higher or similar elevation compared to surrounding land. The site may result in an increase in impermeable area.
Groundwater	No	OPW PFRA mapping indicates that the site is not in an area at risk of groundwater flooding. Due to the site topography, there are no areas that would cause impoundment of groundwater.
Reservoirs / Canals / Artificial Sources	No	There are no impoundments or reservoirs in close proximity to or that drain towards the site.

Flooding mechanisms screened as being significant or possibly significant and requiring further assessment have been assessed further in the following sections.

Mitigation of flood hazards, where required, is detailed in Section 5.2.

4.3 Surface Water (Pluvial) Flooding

4.3.1 Pluvial Flooding onto the Site

The site lies at a higher elevation than surrounding lands. Therefore, surface water runoff from these areas would not be directed towards the site but flow towards lower lying areas to the north, south, east and west.

Therefore, the site is not considered to be at risk of pluvial flooding originating from surrounding lands.

4.3.2 Pluvial Flooding from the Site

The development proposal may cause an increase in impermeable area at the site, meaning it has the potential to increase flood risk elsewhere if not mitigated.

Any change in impermeable area at the site therefore requires mitigation by means of an effective surface water drainage network and surface water management, as discussed in Section 5.2.

5 SUMMARY OF FINDINGS AND RECOMMENDATIONS

5.1 Summary of Findings

The site is not considered to be at significant risk of flooding from any source.

In relation to Flood Zones as defined by the OPW Guidelines, the initial assessment suggests that the site is within Flood Zone C. As such, proposed development at the site will not cause an increase in flood risk elsewhere.

5.2 Design Requirements

The following section details measures incorporated within the proposal submitted in support of the planning application and to be further developed in any detailed design or variation post-determination of the planning application.

5.2.1 Land Use

This assessment demonstrates that the site is not at risk of flooding from any source and will not cause an increase flood risk elsewhere. All proposed development is sited in Flood Zone C, so there is no policy-based restriction on land use within the site boundary.

Notwithstanding, it is noted that the proposed development is considered 'water compatible' and is therefore appropriate in Flood Zone A.

5.2.2 Design Levels

The SFRA and OPW Guidelines require freeboard to be applied to relevant design flood levels when setting Finished Floor Levels (FFLs) and Finished Ground Levels (FGLs). Generally, freeboard is applied to Flood Zone A and Flood Zone B levels, although this does not apply to this site. Therefore, the following are to be considered during development of detailed design for the site:

- FGLs should be designed such that ground falls away from any built development.
- Where adjacent ground unavoidably falls towards a building, drainage design should ensure that water is diverted away from the structures.

5.2.3 Access Levels

In accordance with the OPW Guidelines, access to and egress from the development should be within Flood Zone C (i.e., outside the 0.1% AEP fluvial flood extents).

It has been determined that the site is wholly in Flood Zone C, so safe access to and egress from the proposed development will be possible during an extreme flood event.

5.2.4 Drainage Design

Surface water drainage design should be per the requirements of the Fingal Development Plan 2017-2023 and to the standards of the Fingal County Council Water Services Department.

The Fingal Development Plan 2017-2023 states that it is an objective to incorporate and promote the use of Sustainable Urban Drainage Systems (SuDS), and that these are to be designed in accordance with the Greater Dublin Regional Code of Practice for Drainage Works.

SuDS components, including but not limited to green roofs, rain harvesting, permeable pavement, infiltration trenches, and soakaways, should be considered in relation to the nature and character of the site. The type of SuDS deemed suitable for the site will be subject to outline and detailed design. The SuDS design should demonstrate how water quantity and quality are dealt with as well as make provision for amenity and biodiversity, where practicable.

Drainage design is to be carried out by others and submitted separately at a later stage.

5.3 Maintenance Requirements

5.3.1 Drainage System Maintenance

The owner / occupier(s) shall be responsible for maintenance of drainage networks at the site and ensure that maintenance of the drainage system is provided for. The detailed drainage layout for the site shall ensure that key SuDS features requiring maintenance are situated in accessible public locations.

Maintenance plans for drainage assets should include (where applicable):

- Cyclical (min. annual) check of all surface water drainage features – in particular, clearing of debris.
- Cyclical (min. annual) visual inspection of any surface or underground features – blockages and obstructions to be removed by jetting, as required.

5.4 Summary of Flood Risk and Mitigation

Table 5.1 summarises the mechanisms of flooding identified by this study and their associated hazards / consequence (per the OPW Guidelines) as well as proposed measures to mitigate the predicted risk.

Table 5.1: Summary of Risks and Mitigation

Identified Flood Mechanism	Consequence	Summary and Mitigation Measures
Fluvial / Coastal Flooding	Risk to life and property	All proposed development is situated in Flood Zone C.
Effect of the Development	Increased risk to adjacent lands and developments	All proposed development is situated in Flood Zone C and can therefore have no impact on flooding elsewhere.
Pluvial / Surface Water Flooding	Risk to property on the site, and risk to adjacent lands and property	On-site surface water flooding shall be mitigated, if required, by a site drainage system that complies with local authority drainage standards. Any increase in hardstanding area shall be mitigated by provision of SuDS components to ensure no increase in the rate and volume of surface water runoff from the site as a result of the development.

Appendix A

Drawings

Ballymastone Recreational Hub

Summary of Proposed Works,

-
-
-
-
-
-

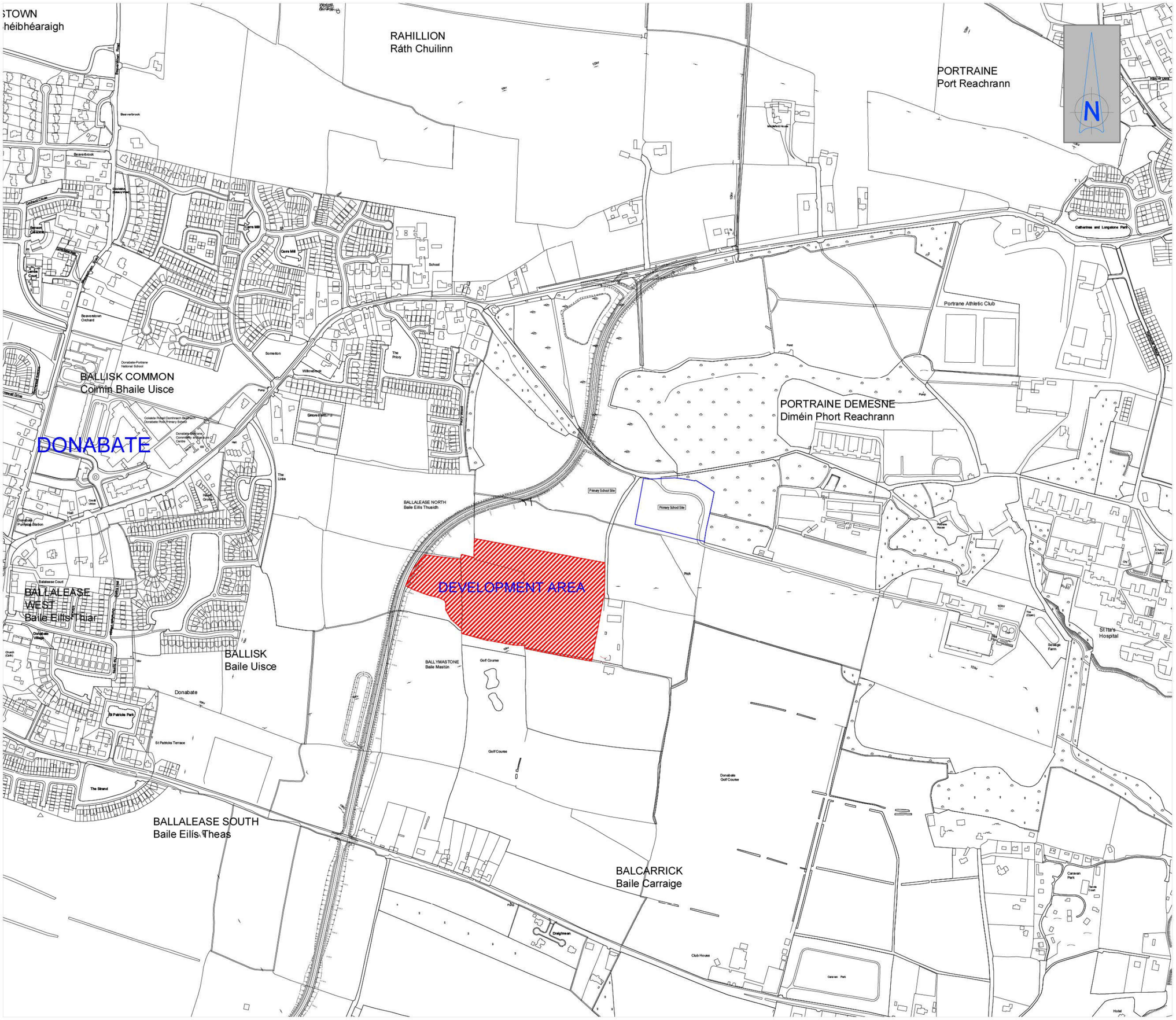
Fingal County Council,
Planning & Strategic Infrastructure Department,
Parks & Green Infrastructure Division,
County Hall,
Swords.

Matthew McAleese
Director of Services

Kevin J. Halpenny
Senior Parks Superintendent

Index No.: 5863_01
Date: March, 2020
Scale 1:2,500 @ A0

Comhairle Contae Fhine Gall
Fingal County Council



Ballymastone Recreational Hub

Summary of Proposed Works

- 8 Lane, 400 Metre All-Weather Running Track
- All-Weather Sports Pitch
- Bleacher Stands
- Carpark (191 Spaces)
- Playground
- Skatepark
- 16 No. Floodlights
- 1.5m High Fence around All-Weather Track
- Associated Path Network
- Earth Berms

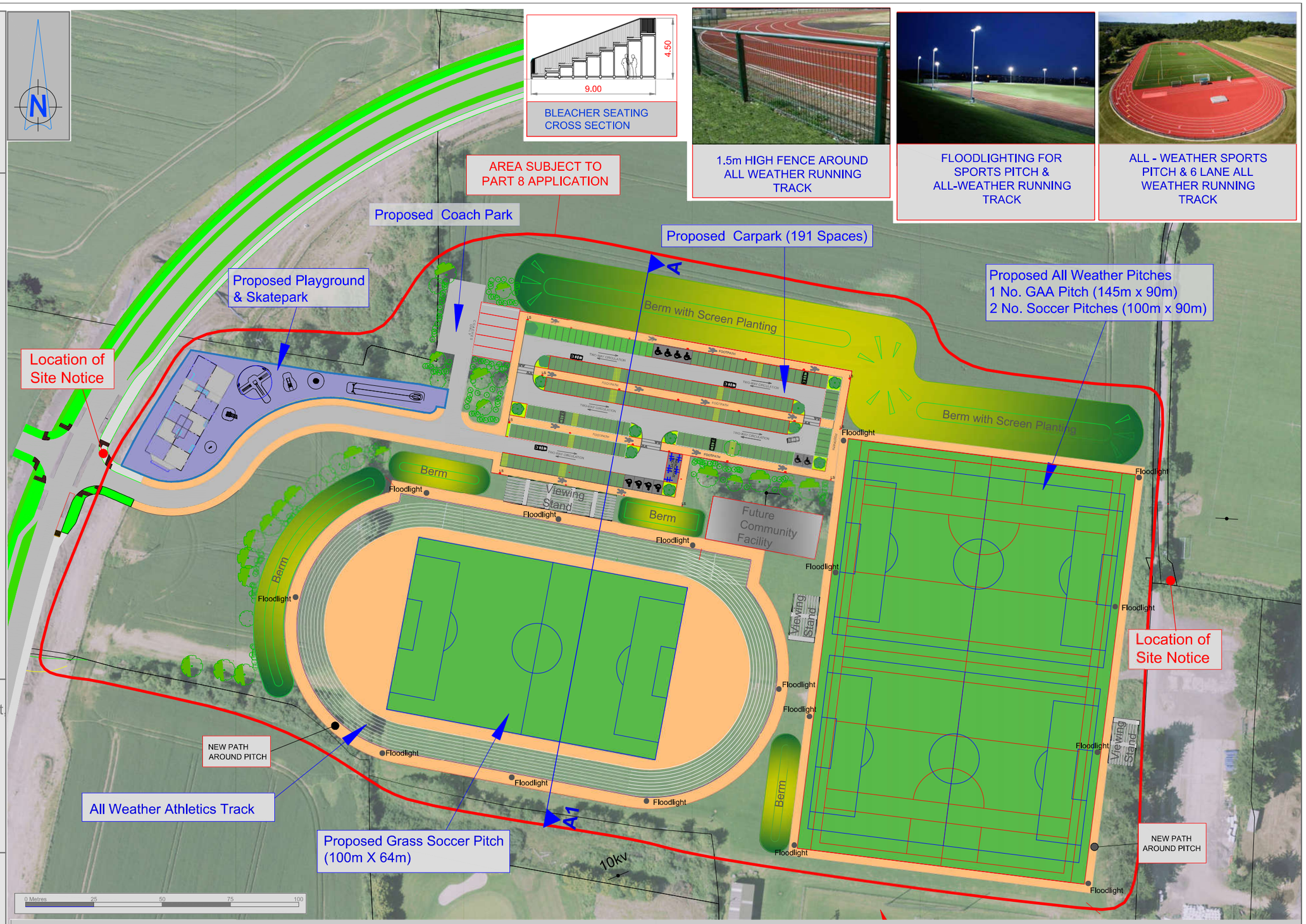
Fingal County Council,
Planning & Strategic Infrastructure Department,
Parks & Green Infrastructure Division,
County Hall,
Swords.

Matthew McAleese
Director of Services

Kevin J. Halpenny
Senior Parks Superintendent

Index No.: P8_5863_10
Date: 28th May, 2021
Scale 1:500 @ A0

Comhairle Contae Fhine Gall
Fingal County Council

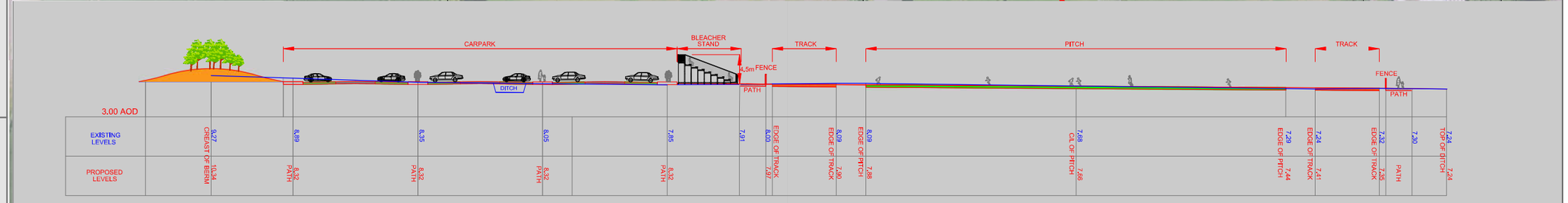


BLEACHER SEATING CROSS SECTION

1.5m HIGH FENCE AROUND ALL WEATHER RUNNING TRACK

FLOODLIGHTING FOR SPORTS PITCH & ALL-WEATHER RUNNING TRACK

ALL - WEATHER SPORTS PITCH & 6 LANE ALL WEATHER RUNNING TRACK



SECTION A - A1

SCALE 1:250

Ballymastone Recreational Hub

Images of:

- Ball Stop Netting
- Weld Mesh Fencing
- Floodlight

Fingal County Council,
Planning & Strategic Infrastructure Department,
Parks & Green Infrastructure Division,
County Hall,
Swords.

Matthew McAleese
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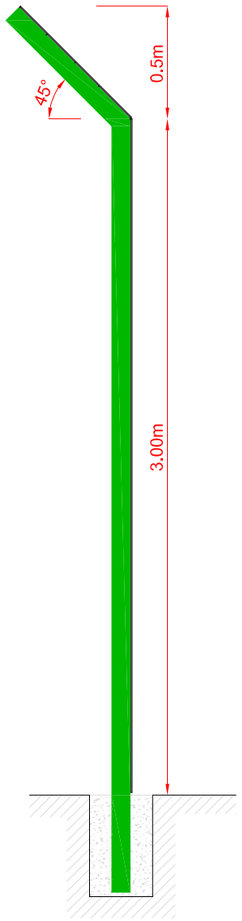
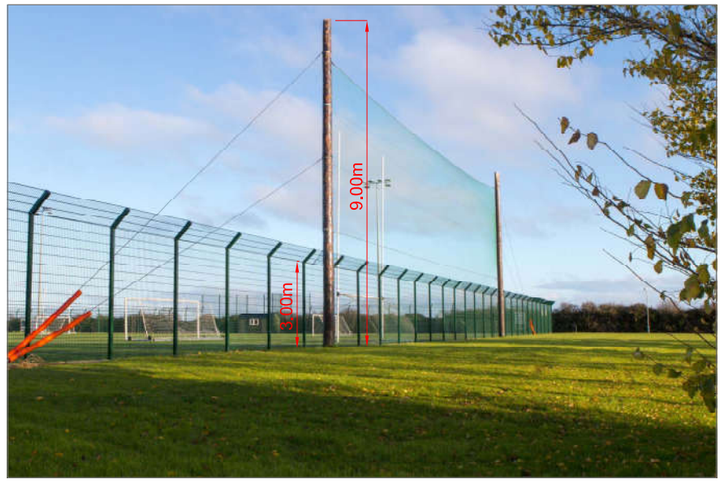
Senior Parks Superintendent

Index No.: P8_5863_12
Date: 28th May, 2021



Section
Weld Mesh Fencing.



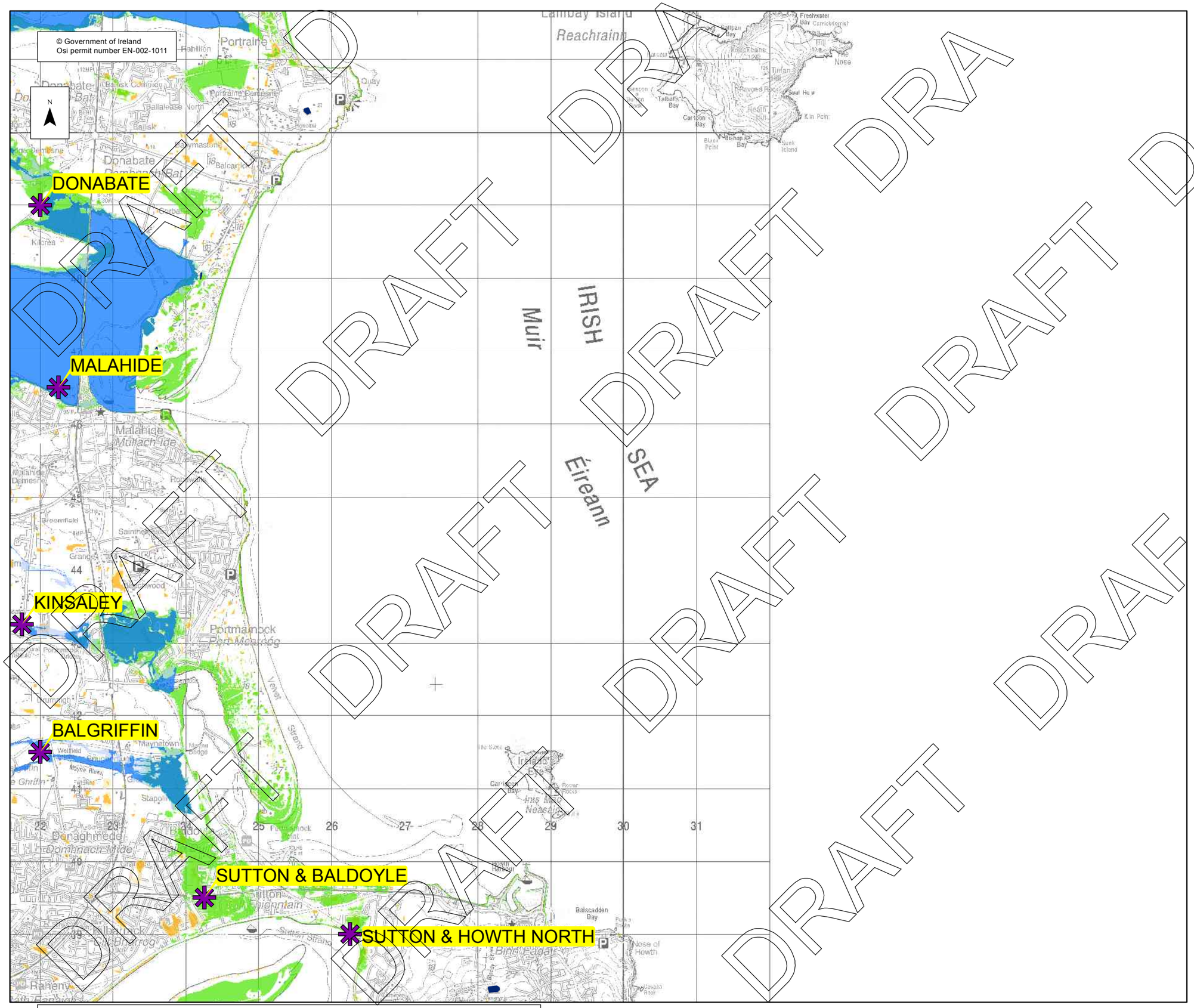
Ball Stop Netting.

Weld Mesh Fencing.

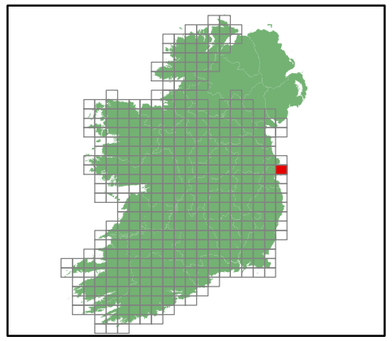
Floodlight.

Appendix B

OPW Flood Maps



Location Plan :



Legend:

Flood Extents

- Fluvial - Indicative 1% AEP (100-yr) Event
- Fluvial - Extreme Event
- Coastal - Indicative 0.5% AEP (200-yr) Event
- Coastal - Extreme Event
- Pluvial - Indicative 1% AEP (100-yr) Event
- Pluvial - Extreme Event
- Groundwater Flood Extents
- Lakes / Turloughs

PFRA Outcomes

- Probable Area for Further Assesment
- Possible Area for Further Assesment

Important User Note:

The flood extents shown on these maps are based on broad-scale simple analysis and may not be accurate for a specific location. Information on the purpose, development and limitations of these maps is available in the relevant reports (see www.cfram.ie). Users should seek professional advice if they intend to rely on the maps in any way.

If you believe that the maps are inaccurate in some way please forward full details by contacting the OPW (refer to PFRA Information leaflets or 'Have Your Say' on www.cfram.ie).

Office of Public Works
Jonathon Swift Street
Trim
Co Meath
Ireland

Project :
PRELIMINARY FLOOD RISK ASSESMENT (PFRA)

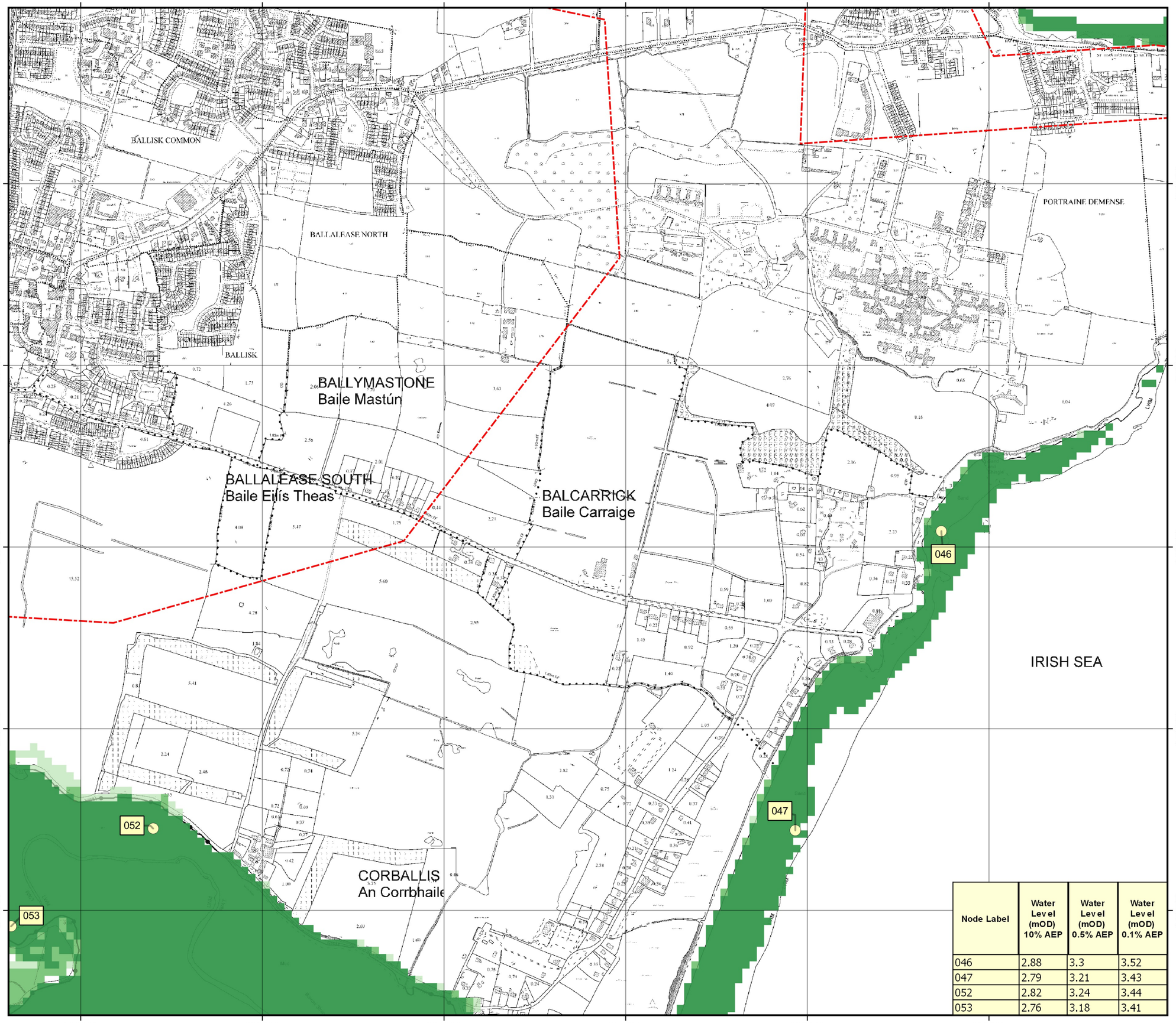
Map :
PFRA Indicative extents and outcomes
- Draft for Consultation

Figure By :	PJW	Date :	July2011
Checked By :	MA	Date :	July 2011

Figure No. : 2019 / MAP / 257 / A

Revision 0

Drawing Scale : 1:50,000 Plot Scale : 1:1 @ A3



Node Label	Water Level (mOD) 10% AEP	Water Level (mOD) 0.5% AEP	Water Level (mOD) 0.1% AEP
046	2.88	3.3	3.52
047	2.79	3.21	3.43
052	2.82	3.24	3.44
053	2.76	3.18	3.41

250 0 250 500 750 1000 Meters

Location Plan:

LEGEND

- AFA Boundary
- Defended Area
- Modelled River Centreline
- Node Point
- 10% AEP Tidal Extent (High Risk)
- 0.5% AEP Tidal Extent (Medium Risk)
- 0.1% AEP Tidal Extent (Low Risk)
- Flood Defence - Embankment
- Flood Defence - Wall
- Gate
- NODE123 — Node Label
- x.x% AEP — Standard of Protection of Flood Defence

IMPORTANT USER NOTE:
THE VIEWER OF THIS MAP SHOULD REFER TO THE DISCLAIMER, GUIDANCE NOTES AND CONDITIONS OF USE THAT ACCOMPANY THIS MAP.

OPW
Oifig na nOibreacha Poiblí
The Office of Public Works

The Office of Public Works
Jonathan Swift Street
Trim
Co. Meath

Project:
FINGAL EAST MEATH FRAM STUDY

Map:
DONABATE
TIDAL FLOOD EXTENT MAP

Map Type:	EXTENT		
Source:	TIDAL		
Map Area:	HPW		
Scenario:	CURRENT		
Drawn by:	IH	Date:	Sep - 2016
Checked by:	MC	Date:	Sep - 2016
Approved by:	JM	Date:	Sep - 2016

Map No.:
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Revision: F0

Map Scale: 1:10,000 Plot Scale: 1:1 @ A3