# Flood Risk Assessment

Application at Church Fields East, Mulhuddart, Dublin 15.

May 2023

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## Quality Assurance – Approval Status

This document has been prepared and checked in accordance with
Waterman Group's IMS (BS EN ISO 9001: 2015, BS EN ISO 14001: 2015)

| Issue | Date | Prepared by | Checked by | Approved by |
|---|---|---|---|---|
| 1 | May 23 | NM | IW | IAn Worrell |

**Comments**

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# 1. Introduction

This Flood Risk Assessment (FRA) has been prepared by Waterman Moylan as part of the documentation in support of the Church Fields East Development planning application for a proposed residential development at Damastown Avenue, in Mulhuddart, Dublin 15.

This FRA has been carried out in accordance with the Department of Housing and Local Government (DEHLG) and the Office of Public Works (OPW) document "The Planning Process and Flood Risk Management Guidelines for Planning Authorities" published in November 2009. This Assessment identifies and sets out possible mitigation measures against potential risks of flooding from various sources. Sources of possible flooding include coastal, fluvial, pluvial (direct heavy rain), groundwater and human/mechanical error.

This report provides an assessment of the subject site for flood risk purposes only.

The site location has been evaluated using CFRAM Maps as defined by OPW Risk Management Guidelines and found that the site falls wholly under Flood Zone C which indicates there is a low probability of flooding.

## 1.1 Site & Proposed Development Description

The proposed development relates to a site of c.5.52 hectares at Church Fields East, Mulhuddart, Dublin 15. The development site is located south of Damastown Avenue; west of Church Road; east of previously permitted residential development at Church Fields (Planning Reg. Ref.: PARTXI/012/21); and north of a permitted linear park (Eastern Linear Park Planning Reg. Ref.: PARTXI/012/21), in the townland of Tyrrelstown, Dublin 15. The proposed development seeks the construction of 217 no. residential units (ranging from 2 – 4 storeys in height) in a mixed tenure development, comprising of 121 no. houses and 96 no. apartments. The development will also include the provision of car parking, cycle parking, new pedestrian / cycle links, services, drainage and attenuation, and all associated site and infrastructural works.

The proposed development consists of:

- 217 Residential units (121 houses, 96 apartments)
- The provision of access roads and associated infrastructure
- SuDS features such as swales, permeable paving, green roofs and rain garden planters.
- Upgrading 2No. attenuation systems in the Church Fields Housing and Eastern Linear Park

Figure 1: Site Location (image taken from Google Earth)


Figure 2: Church Fields Site Strategy (image taken from Google Earth)

## 1.2 Terms of Reference

McCloy Consulting Ltd prepared a Strategic Flood Risk Assessment as part of the Fingal Development Plan 2023-2029. The areas around the subject site were referenced in the document in Sections 5.0 & 6.0. In May 2019, a Strategic Flood Risk Assessment was completed by Roughan & O'Donovan (Document No 19.112/SFRA) on behalf of Fingal County Council for the Church Fields lands. (Extracts from both reports included in Appendices A and B of this report).

The documents have been heavily referenced when producing this report. This report should be read in conjunction with Waterman Moylan drawings and all other Consultants' reports and drawings. The engineering drainage design philosophy is outlined below, and detailed calculations are contained in the Appendices.

## 1.3 General Qualifications and Conditions of Use

The subject report is intended to be an accurate and unbiased account of the site flooding risks. It has been compiled based on information received from the following sources:

- Available drainage record drawings.
- Strategic Flood Risk Assessment by McCloy Consulting as part of the Fingal Development Plan 2023-2029.
- Surface Water Management Plan, Part 1: Strategic Flood Risk Assessment – Church Fields, Mulhuddart, by Roughan & O'Donovan.
- OPW Preliminary Flood Risk Assessment indicative flood maps.
- 'Floodmaps.ie' – The national flood hazard mapping website operated by the Office of Public Works (OPW), where information about past flood events are recorded and made.
- 'Floodinfo.ie'– The interactive website operated by the Office of Public Works (OPW), where printable maps of the communities included in the "Areas for Further Assessment" are made available.
- 'Gis.epa.ie' – Environment & wellbeing mapping website operated by Environmental Protection Agency (EPA).
- 'Gsi.ie' – Geological Survey Ireland is the national earth science knowledge centre operated by the Department of Communications, Climate Action and Environment.
- Internet based search into local flooding.
- Site specific Geotechnical Test Report – Ground Investigations Ireland (February 2018)

This report is based on the above information and prepared for the purpose of making a planning application on this particular site only. The risk categorised above are based on the judgement and experience of the Engineer carrying out the assessment and may be based on information or documentation supplied by others.

# 2. Flood Risk

## Introduction

The components to be considered in the identification and assessment of flood risk are set out in Table 1 (Table A1 of the DEHLG/OPW guidelines) on the Planning Process and Flood Risk Management and are summarised below:

- Tidal – flooding from high sea levels
- Fluvial – flooding from watercourses
- Pluvial – flooding from rainfall/surface water
- Ground Water – flooding from springs / raised groundwater
- Human/mechanical error – flooding due to human or mechanical error

Each component will be investigated from a Source, Pathway and Receptor perspective, followed by an assessment of the likelihood of a flood occurring, and the possible consequences.

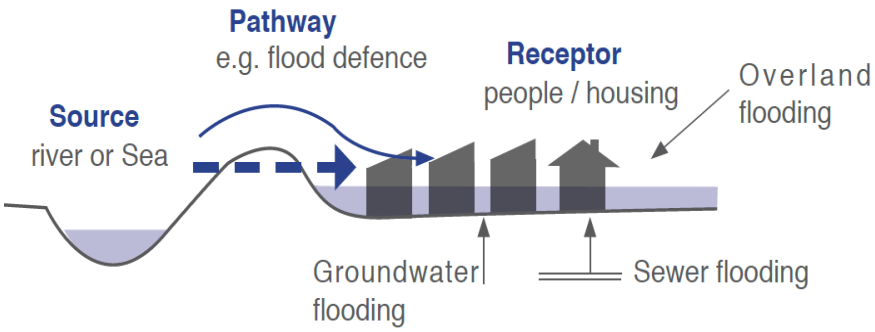



Figure 3: Source-Pathway-Receptor S-P-R Model

The ultimate aim of a flood risk assessment is to combine these components and map or describe the risks on a spatial scale so that the consequences can then be analysed.

The likelihood of flooding falls into three categories; low, moderate and high, as described in the OPW Guidelines and set out in Table 1.

## 2.1 Assessing the Overall Flood Risk

The overall risk of flooding to development shall be determined by way of a 3x3 Risk Matrix, considering the likelihood of a flooding event occurring within the development and the consequences of such flooding.

### 2.1.1 Assessing Likelihood

The likelihood of flooding falls into the categories of low, moderate, and high, which are described in the OPW Guidelines as follows:

Table 1: Table A1 of DEHLG/OPW Guidelines on the Planning Process and Flood Management

| Likelihood | Low | Moderate | High |
|---|---|---|---|
| **Tidal** | Where probability < 0.1 % chance of occurring in a year | 0.5 % chance of occurring in a year > probability > 0.1 % chance of occurring in a year | Where probability > 0.5 % chance of occurring in a year |
| **Fluvial** | Where probability < 0.1 % chance of occurring in a year | 1 % chance of occurring in a year > probability > 0.1 % chance of occurring in a year | Where probability > 1 % chance of occurring in a year |
| **Pluvial** | Where probability < 0.1 % chance of occurring in a year | 1 % chance of occurring in a year > probability > 0.1 % chance of occurring in a year 0.1 % chance of occurring in a year | Where probability > 1 % chance of occurring in a year |

For groundwater and human/mechanical error, the limits of probability are not defined and, therefore, professional judgment is used. However, the likelihood of flooding is still categorized as low, moderate and high for these components. From a consideration of the likelihoods and the possible consequences, the risk is evaluated. Should such a risk exist, mitigation measures will be explored, and the residual risks assessed.

### 2.1.2 Assessing Consequence

There is not a defined method used to quantify a value for the consequences of a flooding event. Therefore, in order to determine a value for the consequences of a flooding event, the elements likely to be adversely affected by such flooding will be assessed, with the likely damage being stated, and professional judgment will be used in order to determine a value for consequences. Consequences will also be categorized as low, moderate and high.

### 2.1.3 Assessing Risk

Based on the determined ‘likelihood’ and ‘consequences’ values of a flood event, the following 3x3 Risk Matrix will then be referenced to determine the overall risk of a flood event. Table 2 of the Planning System and Flood Risk Management Guidelines for Planning Authorities gives a detailed classification of vulnerability for different developments.

Table 2: 3x3 Risk Matrix

| | | CONSEQUENCES | | |
|---|---|---|---|---|
| | | LOW | MODERATE | HIGH |
| LIKELIHOOD | LOW | Extremely Low Risk | Low Risk | Moderate Risk |
| | MODERATE | Low Risk | Moderate Risk | High Risk |
| | HIGH | Moderate Risk | High Risk | Extremely High Risk |

### 2.1.4 Flood Risk Management

After a risk has been assessed, flood risk management is the next stage. Flood risk management aims to minimize the potential risks to people, properties and the environment arising from potential flooding.

### 2.1.5 Residual Risk

The residual risk is the risk that remains after all risks have been assessed and relevant substitution and mitigation measures have been implemented.

# 3. Tidal – Irish Sea

## 3.1 Source

Tidal Flooding is caused by elevated sea levels or overtopping by wave action.

## 3.2 Pathway

The Irish Sea is approximately 15 kilometres east of the subject site. The lowest ground level on the site is approx. 79.88 OD Malin. The Dublin Coastal Protection Project indicated that the 2002 high tide event reached 2.95m OD Malin.


Figure 4: Distance from Subject Site to Irish Sea (image taken from Google Earth)

## 3.3 Receptor

The receptor of any flooding is the proposed residential units on the ground floor.

## 3.4 Likelihood

The risk from tidal flooding is considered extremely low and no flood mitigation measures need to be implemented. The subject site is classified as Flood Zone C, where the probability of flooding from rivers and the sea is low (less than 0.1% or 1 in 1,000).

## 3.5 Consequence

Should the flood level exceed 79.8.m OD Malin level within the subject site, then flooding of the proposed residential buildings will occur which may cause damage to buildings, potential loss of amenities and risk the health of any residents on the site during the flooding event. However, it is extremely unlikely that tidal flooding will occur on the subject site, as the historical maximum sea level recorded is 2.95 OD Malin, which is 76.93m lower than the subject site level. Moreover, the subject site is situated 15km inland from the Irish Sea.

## 3.6 Risk

Taking the flood risk equation from the Guidelines (Flood Risk = Likelihood of Flooding x Consequences of Flooding), there is no risk anticipated for the proposed development regarding tidal flooding.

## 3.7 Flood Risk Management

No mitigation measures are required.

## 3.8 Residual Risk

There is a low risk anticipated for the proposed development with regard to tidal flooding.

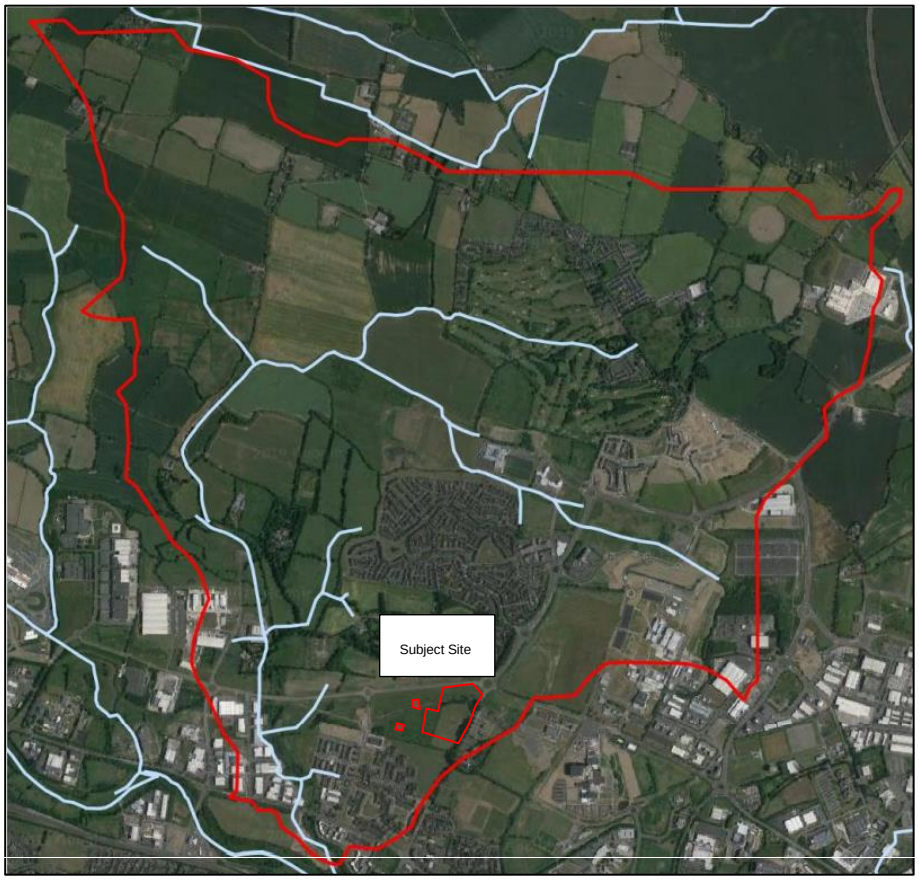
# 4. Fluvial

## 4.1 Source

Fluvial flooding is caused by rivers, watercourses or ditches exceeding their capacity and excess water pilling out onto the adjacent floodplain. Flooding is the result of a river exceeding its capacity and excess water spilling out onto the adjacent floodplain. The East Pinkeen river is the closest waterbody to the subject site, it runs approximately 600m to the west. The lands are drained by the East Pinkeen River which discharges to the Tolka River.

## 4.2 Pathway

A detailed Flood Risk Assessment was carried out for the overall Church Fields lands which include the proposed development. This Flood Risk assessment labelled (Doc. No. 19.112/SFRA) was produced by Roughan & O'Donovan for Fingal County Council in May 2019. The western portion of the Church Fields lands (Church Fields West) is indicated to be within flood zones A and B as per the OPW PFRA mapping (see Appendix A for RO'D mapping). However, the subject site is over 25m above the western lands in this flood zone.



As part of the Strategic Flood Risk Assessment for the Fingal County Development Plan 2023-2029, McCloy Consulting produced a flood zone map for each area inside the administrative boundary. Twenty-six maps were produced in total. Flood Map 18 shows the flood zones for the Damastown area. McCloy Consulting also produced a “High End Scenario” flood map as part of the SFRA. The subject site is located outside of the 0.1% AEP flood event (1:1000 year) even when using these criteria. The PFRA flood maps do not indicate a flooding risk throughout the subject site, please refer to Appendix B for McCloy Consulting flood mapping.

OPW National Flood Hazard Mapping also reports recurring flood events at the confluence of the Tolka River and the East Pinkeen River. OSI Historical Mapping also identifies an area “liable to flooding” at the confluence of the two watercourses. The confluence of the two watercourses is located at approximately 52mOD, which is approximately 27m lower than the lowest ground level on the site, therefore the flood risk to the Church Fields lands as a result of this area prone to recurring flooding is considered low.

## 4.3 Receptor

The receptor of any flooding is the proposed residential units on the ground floor.

## 4.4 Likelihood

The subject site is categorized as Flood Zone C, where the probability of flooding from rivers and the sea is low (less than 0.1% or 1 in 1,000).

## 4.5 Consequence

If the flood level within the subject site exceeds 79m OD Malin level, it may result in flooding of the proposed residential buildings, potentially causing damage to the buildings and risking the health of any residents present during the flooding event. This could also result in the loss of amenities.

The probability of flooding occurring on the subject site is less than 0.1%, and there is no apparent pathway that connects the flood source to the subject site. Therefore, it is improbable that the subject site will be impacted by fluvial flooding.

## 4.6 Risk

Taking the flood risk equation from the Guidelines (Flood Risk = Likelihood of Flooding x Consequences of Flooding), there is no risk anticipated for the proposed development regarding fluvial flooding.

## 4.7 Flood Risk Management

No mitigation measures are required.

## 4.8 Residual Risk

There is a low risk anticipated for the proposed development with regard to fluvial flooding.

# 5. Pluvial

## 5.1 Source

Pluvial flooding is from heavy rainfall and is often referred to as flooding from surface water. Surface water flooding can occur as a result of overland flow or ponding during periods of extreme prolonged rainfall.

## 5.2 Pathways & Receptors

During periods of extreme prolonged rainfall, pluvial flooding may occur through the following pathways:

Table 3: Pluvial Pathway and Receptor Summary

| | Pathway | Receptor |
|---|---|---|
| 1 | Surcharging of the proposed on-site drainage systems during heavy rain events leading to internal flooding | Proposed development – properties and roads |
| 2 | Surcharging from the existing surrounding drainage system leading to flooding within the subject site by surcharging surface water pipes | Proposed development – properties and roads |
| 3 | Surface water discharging from the subject site to the existing drainage network leading to downstream flooding | Downstream properties and roads |
| 4 | Overland flooding from surrounding areas flowing onto the subject site | Proposed development – properties and roads |
| 5 | Overland flooding from the subject site flowing onto surrounding areas | Downstream properties and roads |

It is proposed that the surface water attenuation strategy for Church Fields East of the Church Fields development comprise of an above-ground detention basin with below-ground storage being facilitated by an underground cellular storage system (Stormtech or similar approved).

The surface Water outflow from the subject site would be released via a Hydro-Brake at a rate equal to the greenfield runoff rate of 3.7 l/s/Ha into trunk surface water sewer that serves the masterplan, as agreed with Fingal County Council as part of the masterplan Development.

Refer to Waterman Moylan Drawings No. 20-074-P4200 & P4201 for the proposed drainage layouts.

## 5.3 Likelihood

The likelihood of each of the 5 pathway types are addressed individually as follows:

### 5.3.1 Surcharging of the proposed on-site drainage system:

The proposed on-site surface water drainage sewers have been designed to accommodate flows from a 5-year return event which indicates that on average the internal system may surcharge during rainfall events with a return period in excess of 5 years. All drainage and flood risk calculations include 20 percent climate change in accordance with Fingal County Council Requirements. Therefore, the likelihood of surcharging on the on-site drainage system is considered low.

### 5.3.2 Surcharging of the existing surrounding drainage system

There are no recorded instances of flooding in the drainage networks in the vicinity of the site. The surface water drainage from the proposed development will be attenuated with a restricted outflow, therefore reducing the volume of run-off to the sewer from the current existing flows. The likelihood of flooding due to surcharging the existing drainage network is therefore considered low. Excess storm water arising during periods of heavy rainfall will be stored on site within the attenuation system.

### 5.3.3 Surface water discharge from the subject site

The proposed development site is greenfield. The development as designed will increase the permeable area due to the installation of SUDS measures which will reduce and slow down the run-off from the site. The proposed SuDS measures include permeable paving, roadside swales and infiltration trenches, and rain garden planters in individual back gardens. The result is that there is no likelihood of an increase of surface water discharge from the site leading to downstream flooding. All drainage and flood risk calculations include 20 percent climate change in accordance with Fingal County Council. The likelihood is therefore considered low.

### 5.3.4 Overland flooding from surrounding areas

The OPW records for predictive and historic flood maps and benefiting land maps have been consulted for recorded flood events in the vicinity of the subject site. A map showing all flood events within the immediate vicinity of the subject site was downloaded from the OPW website and is provided below in Figure 6, below.

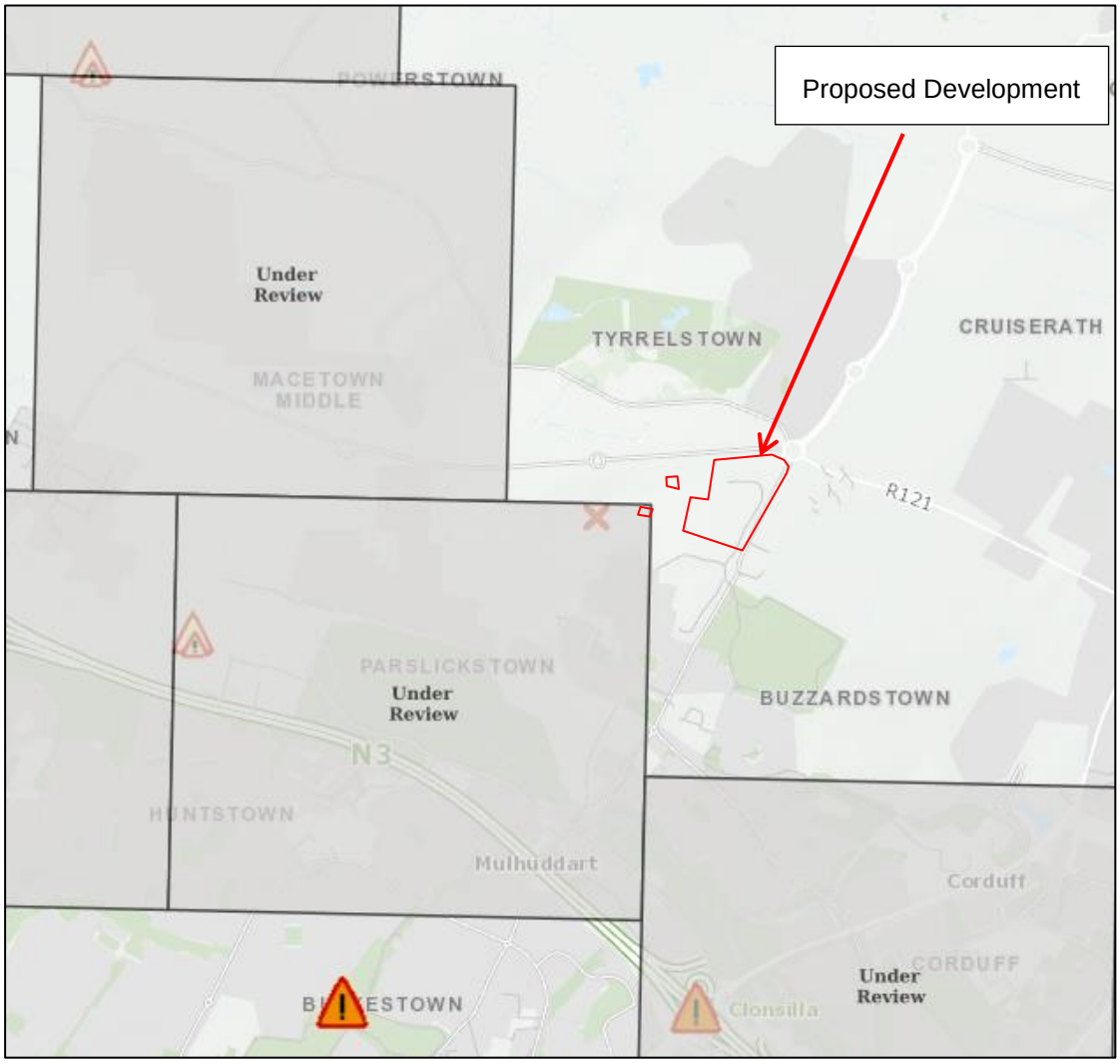



Figure 6: OPW Past flood events

There are 4 No. flood events that have been recorded in a range of approximately 1.1km to 2.2km away from the subject site. These flood events are localized and there is no indication that these will have any residual effect on the subject site. Therefore, the likelihood of flooding from surrounding areas is considered low.

### 5.3.5 Overland flooding from the subject site

The proposed development will include SUDS measures together with an attenuation system for surface water during periods of heavy rainfall. In this regard, there is no likelihood of increased overland flooding from the site leading to downstream flooding. All drainage and flood risk calculations include 20 percent climate change in accordance with Fingal County Council Requirements. The likelihood is considered low.

## 5.4 Consequence

Given the Greenfield nature of the site, the attenuation of surface water and SUDS measures, the consequence of surface water flooding arising from the 5 pathway types is low. Again, the development incorporates appropriate mitigating measures including ensuring buildings are constructed at appropriate levels and the application of SUDS measures.

## 5.5 Risk:

### 5.5.1 Surcharging of the proposed on-site drainage systems

With a high likelihood and low consequence of flooding the site from surcharging the on-site drainage system, the resultant risk is low.

### 5.5.2 Surcharging from the existing surrounding drainage system

With a low likelihood and low consequence of flooding the site from the existing surface water network, the resultant risk is low.

### 5.5.3 Surface water discharging from the subject site.

With a low likelihood and low consequence of flooding downstream of the site due to excess discharge surface water from the site, the resultant risk is low.

### 5.5.4 Overland flooding from surrounding areas

With a low likelihood and low consequence of overland flooding from surrounding areas, the resultant risk remains low.

### 5.5.5 Overland flooding from the subject site

With a low likelihood and low consequence of overland flooding from the subject site, the resultant risk is low.

## 5.6 Flood Risk Management

The following are flood risk management strategies proposed to minimise the risk of pluvial flooding for each risk:

### 5.6.1 Surcharging of the proposed on-site drainage systems

The risk of flooding the proposed buildings is minimised with adequate sizing of the on-site surface water network and SUDS devices such as, flow restrictions, storage tanks etc. The risk from any surcharged surface water is also reduced due to finished floor levels being above the adjacent road levels and with overland flood routing incorporated into the development.

### 5.6.2 Surcharging from the existing surrounding drainage systems

The risk from flooding the proposed buildings from surcharging of the existing surface water network is reduced by setting finished floor levels of the buildings above the adjacent road levels and with overland flood routing along the road network.

### 5.6.3 Surface water discharging from the subject site.

Surface water discharging from the development will be limited by a hydrobrake flow restriction device to ensure the maximum discharge rate from the site is limited to 3.7 l/s/Ha, as agreed with Fingal County Council as part of the Masterplan development.

Excess discharge flows from the development will be attenuated in the detention pond and stone tank system as indicated on Waterman Moylan Drawing No. 20-074-P4210.

### 5.6.4 Overland flooding from surrounding areas

The risk from overland flooding from surrounding areas is low due to the finished buildings/ floor levels, being set 500mm above the top water level of the attenuation system in the 1:100 year storm and between 150mm and 300mm higher than the surrounding area.

### 5.6.5 Overland flooding from the subject site

The risk is minimised by providing overland flooding through the development with raised finished floor levels, generally between 150mm and 300mm above the adjacent road network.

## 5.7 Residual Risk

As a result of the design measures detailed above in Section 5, there is a low residual risk of flooding from each of the surface water risks. The flood risk management measures set out in Section 5 will minimise the risk.

# 6. Ground Water

## 6.1 Source

During periods of prolonged rainfall, the groundwater can seep to above ground level.

## 6.2 Pathway

During periods of prolonged rainfall, there is a possibility that the groundwater level could rise. This may result in groundwater seeping above the ground surface.

## 6.3 Receptor

The receptor would be proposed open spaces and below ground drainage networks on the Church Fields lands.

## 6.4 Likelihood

There is no known history of groundwater/ springs seeping through the ground in this area. Ground Investigations Ireland (GII) completed geotechnical testing at the subject site as part of the overall Church Fields Site Strategy. Their report includes trial pits, and soakaway design. Trial pits 34-50 cover the subject site. There is no record of a groundwater strike in any of the trial pits. Soakaway test location 4 also determine that the soil is suitable for infiltration using BRE Digest 365.

## 6.5 Consequence

The consequence of ground water flooding would be some minor temporary seepage of groundwater through the ground around the housing units and landscaped areas. Underground services may also be inundated from high water tables. Therefore, the consequence of ground water flooding occurring at the proposed development is considered low.

## 6.6 Risk

Referencing the Risk Matrix in Section 2.1.3 (Table 2) of this report for a flood event of a low likelihood with low consequences, it is deemed that the risk from ground water flooding on the proposed development is low.

## 6.7 Flood Risk Management

Given that the flood risk of overland flooding from the subject site is low, no further flood risk management measures are deemed necessary.

# 7. Human / Mechanical Errors

## 7.1 Source

The site will be drained by an internal private storm water drainage system which discharges to the existing water course to the west of the subject site proposed flow control, installed at the downstream manhole of the proposed attenuation system within the site. This internal surface water network is the source of possible flooding from the system if it were to block.

## 7.2 Pathway

If the proposed private drainage system blocks this could lead to possible flooding within the site.

## 7.3 Receptor

The receptors would be properties and surrounding landscaped areas.

## 7.4 Likelihood

There is a high likelihood of localised flooding on the subject site if the surface water network were to block.

## 7.5 Consequence

The surface water network would surcharge and overflow through gullies and manhole lids.

## 7.6 Risk

There is a medium risk of surface water overflowing onto the surrounding road network, should the surface water network block.

## 7.7 Flood Risk Management

As described in Section 5, levels on site have been designed such that in the event of the surface water system surcharging, surface water can still escape from the site by overland flood routing without damaging any properties. The surface water network would need to be unblocked and maintained should a blockage occur.

## 7.8 Residual Risk

As a result of the flood risk management outlined above, there is a low residual risk of overland flooding from human / mechanical error.

# 8. Conclusions and Recommendations

The subject site is outside of the 0.1% AEP (1 in 1,000 year) flood event for both fluvial and coastal flooding. Therefore, the site can be classified as Flood Zone C, suitable for development. This site specific flood risk assessment SFRA has been carried out in accordance with the requirements of the OPW "The Planning System and Flood Risk Management Guidelines for Planning Authorities", 2009. The site has been analysed for risks including tidal, fluvial, pluvial, groundwater and drainage system failures due to human or mechanical failure.

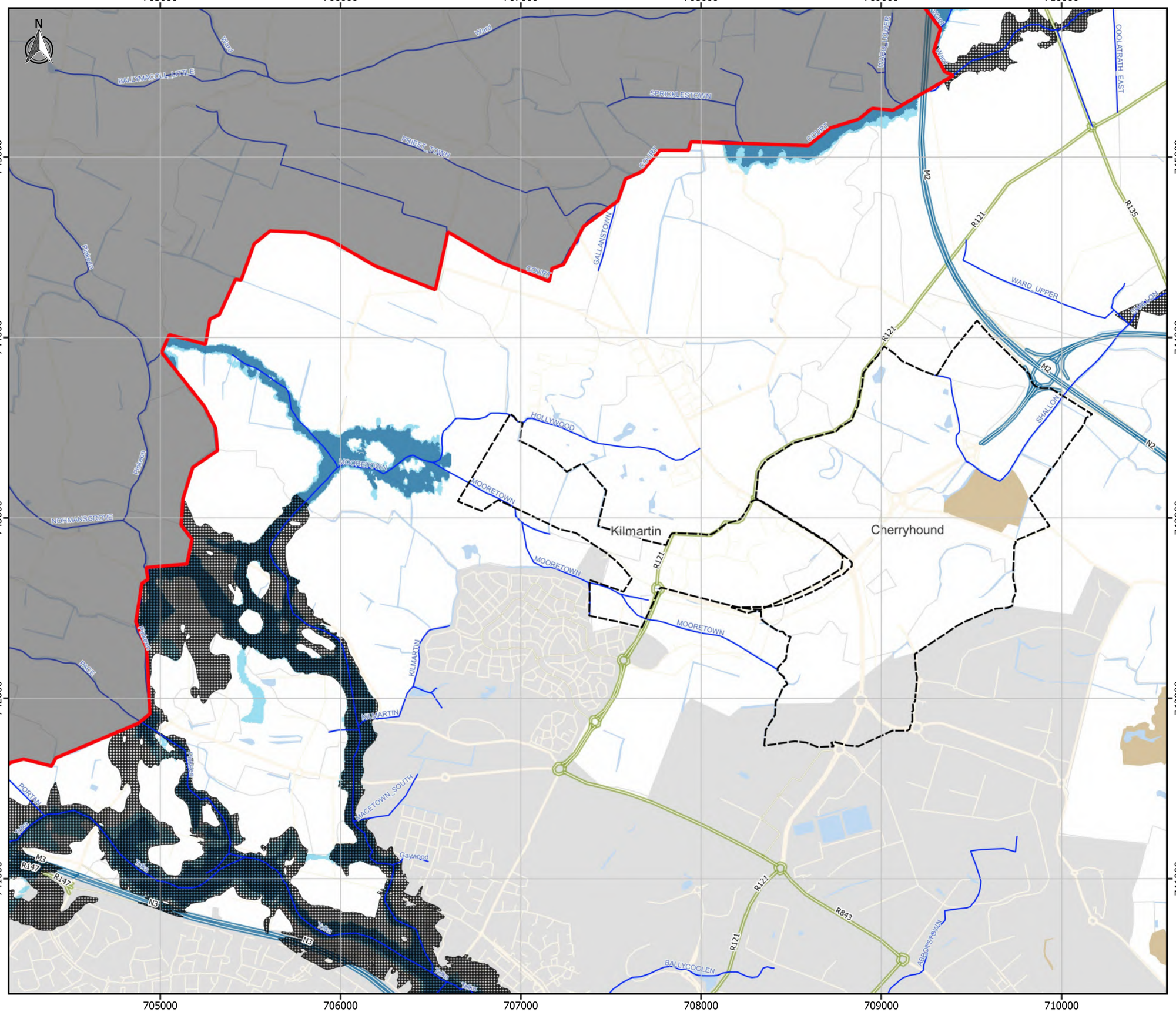
Table 4 presents the various residual flood risks involved. As the flood risk from all sources can be mitigated, with all residual risks seen as low, the proposed site can be considered acceptable in terms of an overall flood risk.

Table 4: Summary of the Flood Risks from each flooding type

| Source | Pathway | Receptor | Likelihood | Consequence | Risk | Mitigation Measure | Residual Risk |
|---|---|---|---|---|---|---|---|
| **Tidal** | None | Proposed Development | Low | Low | Extremely Low | none | **Extremely Low** |
| **Fluvial** | None | Proposed Development | Low | Low | Low | none | **Low** |
| **Pluvial** | Private and Public Drainage Network | Proposed Development | Low | Low | Low | SuDS measures, flood routing, raised FFL's | **Low** |
| **Ground Water** | Ground | Proposed Development | Low | Low | Low | n/a | **Low** |
| **Human / Mechanical Error** | Drainage network | Proposed Development | Moderate | Moderate | Moderate | Maintenance of sewer system, flood routing, raised FFLs | **Low** |

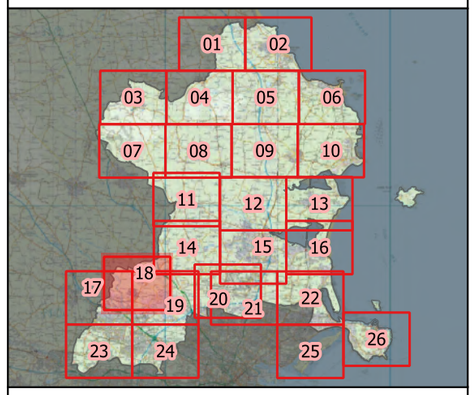
# Appendix A

# Fluvial Flood Mapping (High End Scenario) by Roughan & O'Donovan






## KEY PLAN




**LEGEND**

- Fingal County Administrative Boundary
- Watercourses
- LAP & Masterplan Boundaries
- 1% / 0.5% AEP HEFS Flood Extent
- 0.1% AEP HEFS Flood Extent
- No Climate Change Data Available; Present Day Flood Data Only.CC Flood Risk Subject to Site Specific Assessment
- Area for Further Consideration

| REV: | NOTE: | DATE: |
|---|---|---|
| 02 | DRAFT ISSUE | 01/12/2021 |

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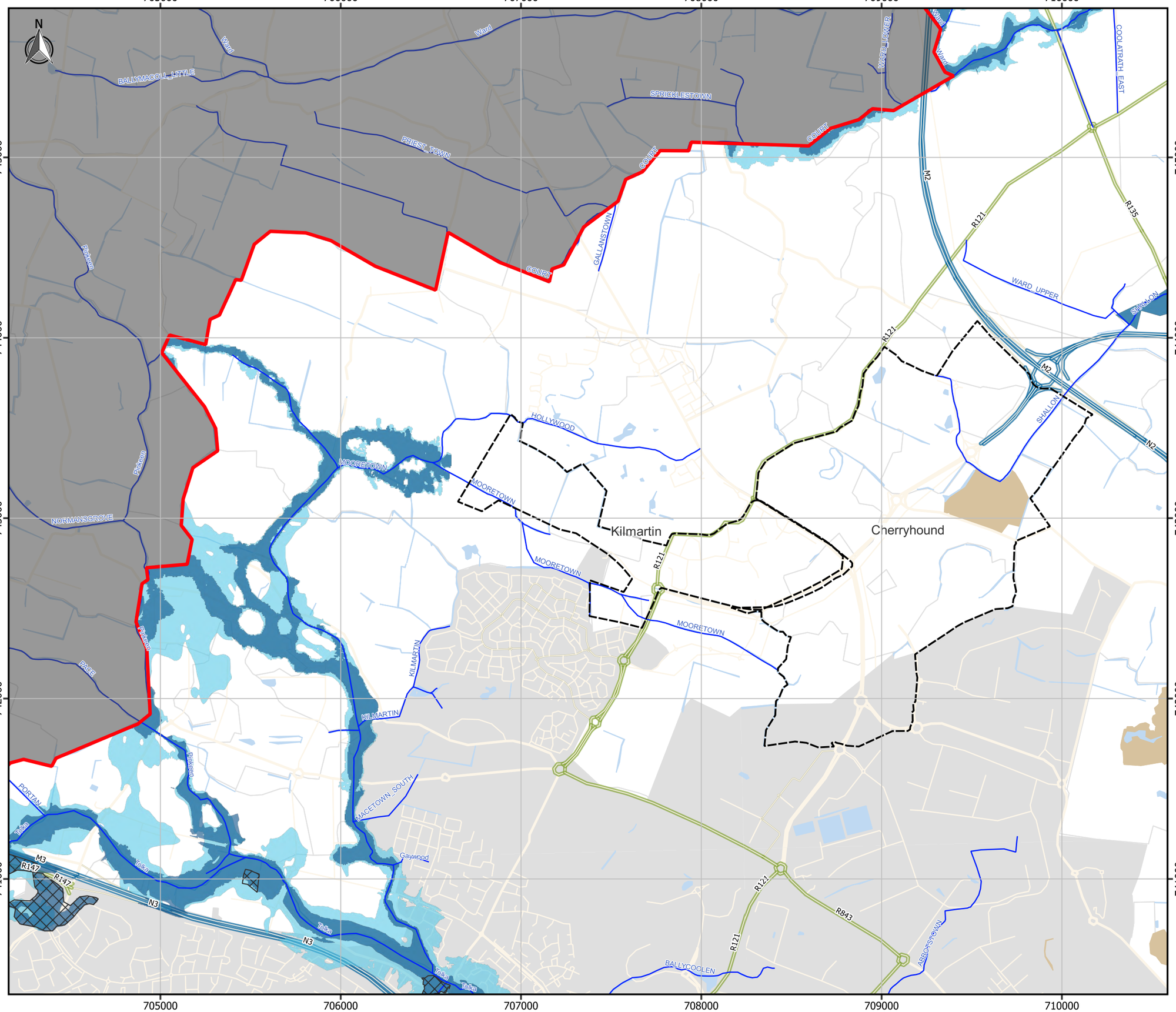
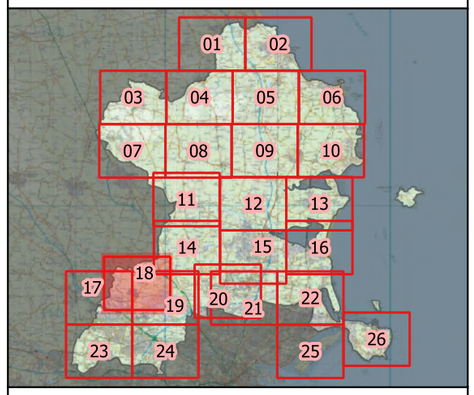
| | | |
|---|---|---|
| **MAP:** | HIGH END FUTURE SCENARIO FLOOD EXTENT | |
| **FLOOD PROBABILITY:** | FLUVIAL: 1% / 0.1% | COASTAL: 0.5% / 0.1% |
| **SOURCE CRS:** | | ITM EPSG:2157 |
| **DRAWN BY:** | DL | DATE: 01/12/2021 |
| **CHECKED BY:** | PS | DATE: 01/12/2021 |
| **APPROVED BY:** | DKS | DATE: 01/12/2021 |
| **DRAWING NUMBER:** | M02127-06_FIG_FL318 | |
| **MAP SERIES:** | | PAGE 18 OF 26 |
| **DRAWING SCALE:** | | 1:20000 @ A3 |






## KEY PLAN




**LEGEND**

- Fingal County Administrative Boundary
- Watercourses
- LAP & Masterplan Boundaries
- Flood Zone A
- Flood Zone B
- Defended Areas
- Area for Further Consideration

| REV: | NOTE: | DATE: |
|---|---|---|
| 03 | DRAFT ISSUE | 22/02/2022 |

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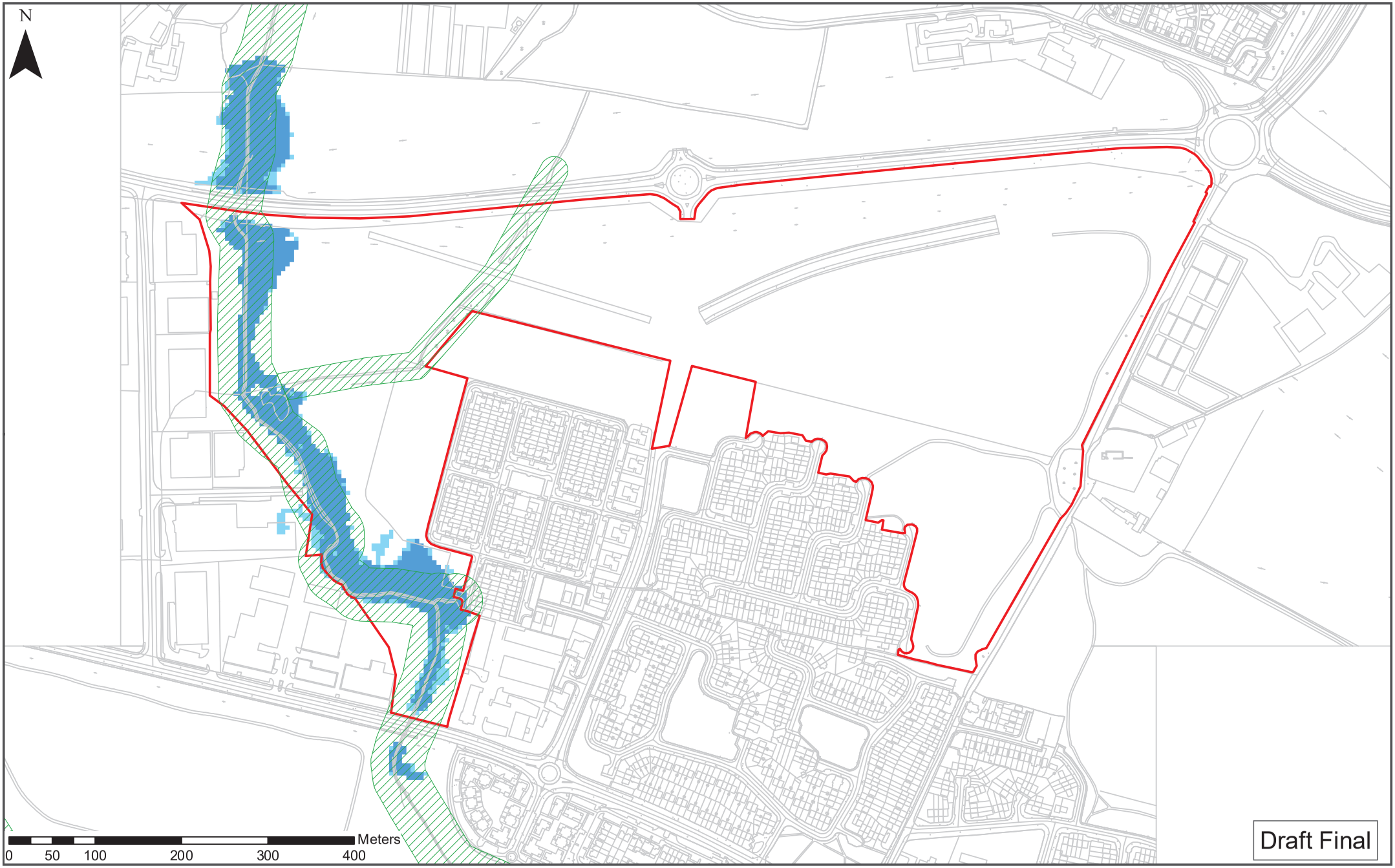
| | | |
|---|---|---|
| **MAP:** | FLOOD ZONE MAP | |
| **FLOOD PROBABILITY:** | FLUVIAL: 1% / 0.1% | COASTAL: 0.5% / 0.1% |
| **SOURCE CRS:** | | ITM EPSG:2157 |
| **DRAWN BY:** | DL | DATE: 22/02/2022 |
| **CHECKED BY:** | PS | DATE: 22/02/2022 |
| **APPROVED BY:** | DKS | DATE: 22/02/2022 |
| **DRAWING NUMBER:** | M02127-06_FIG_FL118 | |
| **MAP SERIES:** | | PAGE 18 OF 26 |
| **DRAWING SCALE:** | | 1:20000 @ A3 |




**Legend**

- Riparian Corridor
- Site Boundary
- Churchfields - 1 in 100 Year Fluvial Event - High End Future Scenario
- Churchfields - 1 in 1000 Year Fluvial Event - High End Future Scenario

| No. | Revision | Date | By | Chk'd | App'd |
|---|---|---|---|---|---|
| DF01 | Riparian Corridor added | 01/05/2019 | BP | WV | JPR |
| D01 | Draft Flood Extents | 13/03/2019 | BP | WV | JPR |

| Stage | Date | App'd |
|---|---|---|
| PRELIMINARY | | |
| APPROVAL | | |
| TENDER | | |
| CONSTRUCTION | | |

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| Designed: | Checked: | Approved: | Status: |
|---|---|---|---|
| BP | WV | JPR | DRAFT FINAL |

Project Title: Churchfields Surface Water Management Plan

Drawing Title: Fluvial Flood Extents (High End Future Scenario)

| Drawn: | Job No: | Drawing No: | Rev: |
|---|---|---|---|
| BP | 19.112 | 19.112-CF-107 | DF01 |

Scale: 1:4,000 (@ A3) | Date: 13/03/2019



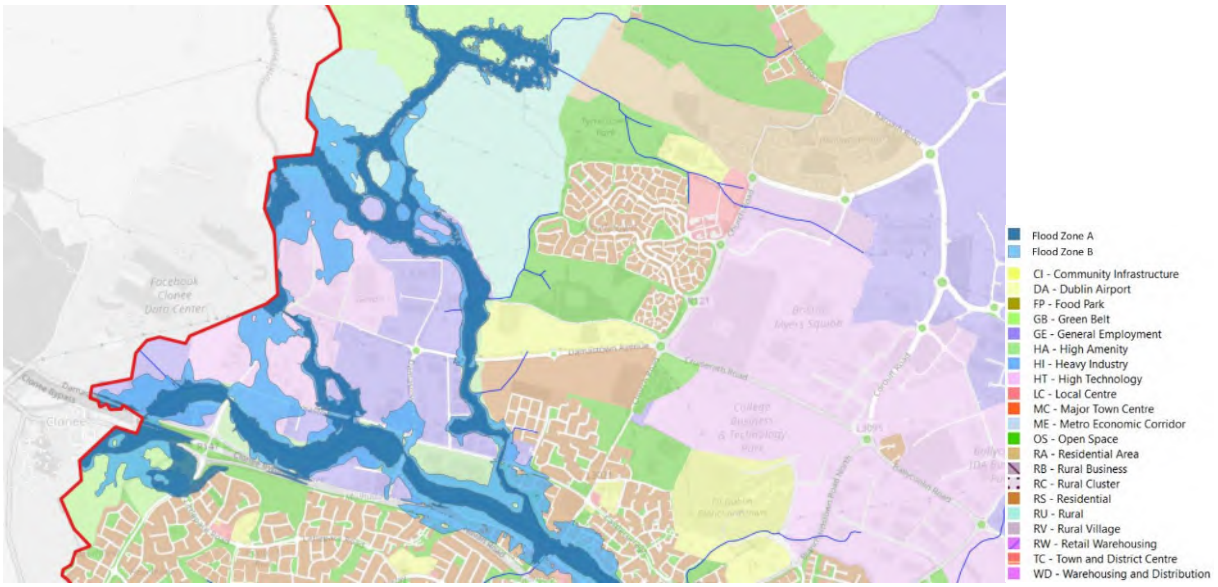
01 May 2019 09:04:52 Drawing Location: J:\2019\19112\19112-02_WIP\08 MODELS\05 GIS\01 MXD\Flood Extents\Draft\Fluvial\19.112-CF-107 Fluvial Flood Extents HEFS DF01.mxd

DO NOT SCALE USE FIGURED DIMENSIONS ONLY

## Appendix B

## Flood Zone Map 18 by McCloy Consulting as part of SFRA for Draft Fingal Development Plan 2023-2029

### 5.2.15 Damastown / Macetown / Clonee




| | |
|---|---|
| **Flood Zone Data Source(s)** | NIFM, Tolka Flood Study (*subject to model review*) |
| **Criteria 1** | Damastown, Macetown and Clonee is an industrial area to the west of Fingal in the Blanchardstown area. The area provides a local employment area where the retention of existing enterprises and the promotion of new local employment opportunities will be encouraged, in accordance with the Regional Planning Guidelines and has been zoned accordingly. |
| **Criteria 2** | This area is well established, and the zoning is necessary to provide for some employment for the local rural population. The area is on the outskirts of Blanchardstown, near the county boundary with Meath. No other lands are available. |
| **Criteria 3** | This SFRA has demonstrated that parts of the zoned lands are at risk of flooding and within Flood Zone A and Flood Zone B. The source of the flood zone data (NIFM, Tolka Flood Study) is not considered suitable for this Stage 2 Initial Flood Risk Assessment.<br>It is recommended that an appropriately detailed site-specific FRA be submitted with any planning application for proposed development of those lands demonstrated to be at risk of flooding to ensure future development satisfies Criteria 3 of this Justification Test.<br>Site-specific FRAs should be prepared in accordance with the development management guidance set out in Section 6 of this SFRA. |

# UK and Ireland Office Locations