

**Public Realm Improvements for a
Pedestrianised New Street**

Site Specific Flood Risk Assessment

222126-PUNCH-XX-XX-RP-C-0004

April 2023

Document Control

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1 Introduction

1.1 Background

PUNCH Consulting Engineers were appointed by Fingal County Council to carry out a Site-Specific Flood Risk Assessment for the proposed public realm improvements at a pedestrianised New Street, located in Malahide, Co. Dublin.

The assessment has been prepared as part of a planning submission package and is carried out in full compliance with the requirements of “The Planning System & Flood Risk Management Guidelines” published by the Department of the Environment, Heritage and Local Government in November 2009.

The proposed site layout is detailed in a series of drawings provided by DFLA in the planning submission documentation.

1.2 Existing Site

The site is approximately 0.22 hectares in area located in Malahide Village on New Street. The site currently consists of an established town street with retail, commercial and residential development throughout. The topography of the street consists of the site falling from its highest point at the southern extents of the site (The Mall) and falling towards the lowest point at the northern extents of the site (Strand Street).

The site is bounded by retail, commercial and residential developments to the west and east, a junction on Strand Street to the north, and a junction on The Mall (R106) to the south. The junctions on either end of New Street are both signalised. New Street is approximately 100m southwest of the marina. The street is pedestrianised with restricted vehicular access to enable deliveries allowed between 7am and 11 am only, refuse collection and emergency vehicles. The site is accessed via The Mall (R106) to the south and via Strand Street to the north. Please refer to Figure 1-1 below illustrating the site boundary.

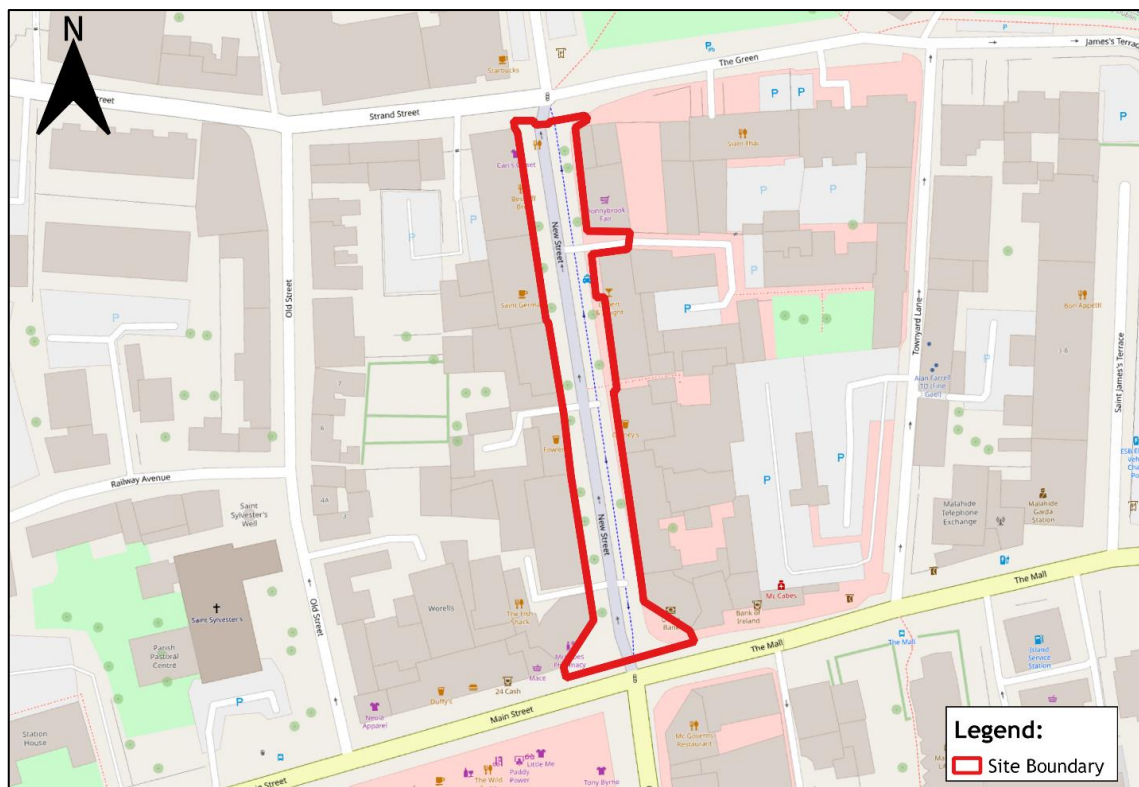


Figure 1-1: Site Location Plan.

1.3 Nature of the Proposed Development

The proposed public realm improvements will comprise: -

- i. Widening of footpaths and provision of new kerb edges with existing kerbstones retained, realigned and protected within the widened footpaths and public spaces.
- ii. Realignment and narrowing of the trafficable section of New Street (c.150m in length, 0.22ha) and insertion of control measures and all necessary signage to provide for a pedestrianised street with associated traffic flow routes and restrictions allowing for time limited one-way access from 7am to 11am each day for deliveries and emergency vehicles from Main Street/ The Mall to New Street and a two-way access from Strand Street to Ross's Terrace via New Street.
- iii. Upgrade of all street surfaces.
- iv. Provision of 2no. loading bays at the southern and northern ends of New Street and an accessible parking space in front of the HSE building.
- v. Installation of cycle stands at 6no. locations on New Street with capacity for 23no. cycle parking spaces.
- vi. Removal and replacement of 11no. existing trees with 37no. trees of species appropriate to the location and environment and provision of soft landscaping and green infrastructure with planting zones for seeded, planted and hedging areas and associated bioretention and tree pit areas.
- vii. Provision of outdoor dining zones including tables and chairs and other ancillary moveable structures.
- viii. Provision of street furniture including seating, benches and litter and recycling bins and a water feature.
- ix. New public lighting.
- x. Upgrade of the watermain and foul drainage networks and upgrade and relocation of the surface water drainage network including provision of sustainable urban drainage systems (SUDs) features as part of hard and soft landscaping.
- xi. Provision of ducting for existing and future utilities and piped infrastructure.
- xii. All associated site and development works.

Fingal County Council will be providing regulatory traffic signs in accordance with Section 95 of the Road Traffic Act 1961 (as amended).

The proposed public realm improvements are outlined in a series of architectural drawings prepared by DFLA, and engineering drawings prepared by PUNCH Consulting Engineers supplied as part of the planning submission.

Please refer to Architectural Documents for full proposed site layout.

2 Relevant Guidance

2.1 “The Planning System and Flood Risk Management” Guidelines

In September 2008, “The Planning System and Flood Risk Management” Guidelines were published by the Department of the Environment, Heritage and Local Government in Draft Format. In November 2009, the adopted version of the document was published. This assessment has been prepared as part of a planning submission package.

The Flood Risk Management Guidelines give guidance on flood risk and development. The guidelines recommend a precautionary approach when considering flood risk management. The core principle of the guidelines is to adopt a flood risk sequential approach to managing flood risk and to avoid development in areas that are at risk. The sequential approach is based on the identification of flood zones for river and coastal flooding. The guidelines include definitions of Flood Zones A, B and C, as noted in Table 2-1 below. It should be noted that these do not take into account the presence of flood defences, as there remain risks of overtopping and breach of the defences.

Table 2-1: Flood Zone Designation

Flood Zone	Type of Flooding	Annual Exceedance Probability (AEP)
Flood Zone A	Coastal	Less than a 1:200 (0.5% AEP) year event
	Fluvial	Less than a 1:100 (1% AEP) year event
Flood Zone B	Coastal	Greater than a 1:200 (0.5% AEP) and less than a 1:1000 (0.1% AEP) year event
	Fluvial	Greater than a 1:100 (1% AEP) and less than a 1:1000 (0.1% AEP) year event
Flood Zone C	Coastal	Greater than a 1:1000 (0.1% AEP) year event
	Fluvial	Greater than a 1:1000 (0.1% AEP) year event

Once a flood zone has been identified, the guidelines set out the different types of development appropriate to each zone. Exceptions to the restriction of development due to potential flood risks are provided for through the use of the **Justification Test**, where the planning need and the sustainable management of flood risk to an acceptable level must be demonstrated. This recognises that there will be a need for future development in existing towns and urban centres that lie within flood risk zones, and that the avoidance of all future development in these areas would be unsustainable.

A three staged approach to undertaking an FRA is recommended:

Stage 1: Flood Risk Identification - Identification of any issues relating to the site that will require further investigation through a Flood Risk Assessment;

Stage 2: Initial Flood Risk Assessment - Involves establishment of the sources of flooding, the extent of the flood risk, potential impacts of the development and possible mitigation measures;

Stage 3: Detailed Flood Risk Assessment - Assess flood risk issues in sufficient detail to provide quantitative appraisal of potential flood risk of the development, impacts of the flooding elsewhere and the effectiveness of any proposed mitigation measures.

This report addresses the requirements for Stage 2.

2.2 Previous Fingal Development Plan 2017-2023

Chapter 7 of the previous Fingal Development Plan 2017-2023 includes policies on surface water and flooding. The policy relevant to this document is as follows:

SW07 Implement the Planning System and Flood Risk Management-Guidelines for Planning Authorities (DoEHLG/OPW 2009) or any updated version of these guidelines. A site-specific Flood Risk Assessment to an appropriate level of detail, addressing all potential sources of flood risk, is required for lands identified in the SFRA, located in the following areas: Courtlough; Ballymadun; Rowlestown; Ballyboghil; Coolatrath; Milverton, Skerries; Channell Road, Rush; Blakescross; Lanestown/Turvey; Lissenhall, Swords; Balheary, Swords; Village/Marina Area, Malahide; Streamstown, Malahide; Balgriffin; Damastown, Macetown and Clonee, Blanchardstown; Mulhuddart, Blanchardstown; Portrane; Sutton; and Howth, demonstrating compliance with the aforementioned Guidelines or any updated version of these guidelines, paying particular attention to residual flood risks and any proposed site specific flood management measures

A Strategic Flood Risk Assessment (SFRA) was completed for Fingal County Council (FCC) in February of 2016 to supplement the Fingal Development Plan 2017-2023. FCC's Policy SW07 above is replicated as part of this planning submission.

2.3 Fingal Development Plan 2023-2029

The Strategic Flood Risk Assessment included in the Fingal Development Plan 2023 - 2029 provides a list of Council Objectives with regards to flood risk. The objectives relevant to this report are as follows:

It is an objective of the Council to:

- IUP12 Ensure the continued incorporation of Flood Risk Management into the spatial planning of the County of Fingal, to meet the requirements of the EU Floods Directive and the EU Water Framework Directive and to promote a climate resilient County.*
- IUP14 Continue to support and assist the OPW in implementing and delivering the relevant CatchmentBased Flood Risk Assessment and Management Programmes for rivers, coastlines and estuaries within Fingal.*
- IUP16 Have regard to the OPW Flood Risk Management Guidelines (2009), as revised by Circular PL 2/2014, when assessing planning applications and in the preparation of statutory and non-statutory plans and to require site specific flood risk assessments are to be considered for all new developments within the County. All development must prepare a Stage 1 Flood Risk Analysis and if the flooding risk is not screened out, they must prepare a Site Specific Flood Risk Assessment (SFRA) for the development, where appropriate.*

A Strategic Flood Risk Assessment (SFRA) was completed by Fingal County Council to supplement the Fingal Development Plan 2023 - 2029.

2.4 Land Zoning

The land on which the development is proposed is currently a street and therefore not defined by a land zoning. It is noted that the lands adjacent to either side of New Street are zoned as “TC: Town and District Centre” in the Fingal Development Plan 2023 - 2029 Interim Publication. An extract is shown in Figure 2-1.

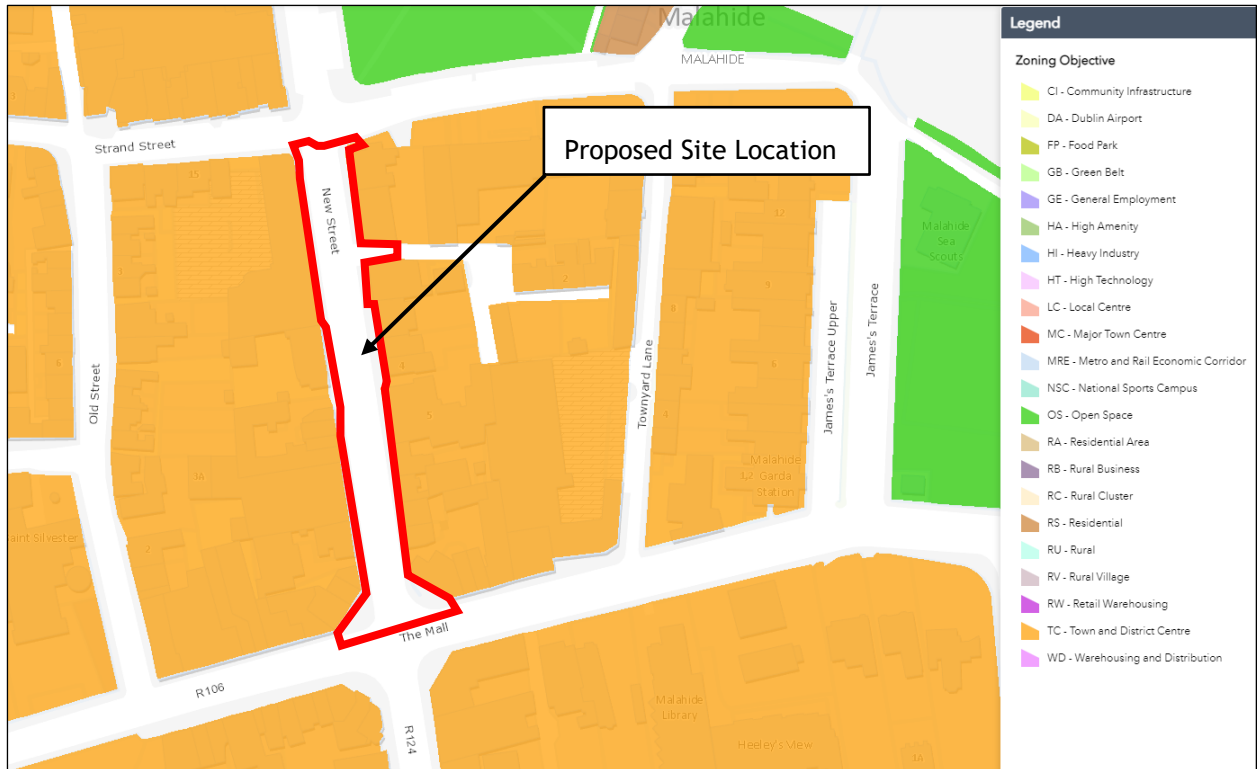


Figure 2-1: Land Use Zoning (Extract from Fingal Development Plan 2023 - 2029 Interim Publication).

3 Flood Risk Identification

3.1 Existing Hydrogeological Environment

The existing hydrological environment is characterised primarily by the presence of the water associated with the Broadmeadow River, and Malahide Bay. The dominant hydrological features in the vicinity contributing to the Broadmeadow Water/ Malahide Bay are the Ballymadrough River, Broadmeadow River, and the Gaybrook Stream. The watercourse locations are shown in Figure 3-1.



Figure 3-1: Hydrological Environment around the site.

3.2 Topographical Survey

A topographical survey of the site and its environments was completed by Apex Surveys in July 2022. The topography of the site falls steeply in a south-north direction, with levels ranging from 9.24m at the southern end of the site, and 2.84m at the northern end of the site.

3.3 Site Walkover

PUNCH Consulting Engineers visited the site on 2nd of February 2022 to assess conditions and key features of the site, to establish any potential sources of flooding and to identify the likely routes of flood waters. Appendix A contains a selection of key images taken during the site visits.

The following was established from the site visit:

- The site was accessed via Strand Street.
- Ground was dry at the time of the visit. The entirety of the sites consists of hardstanding areas (existing street and footpaths).
- The site is bounded by retail, commercial and residential developments to the west and east.
- Levels in the site were steep with a noticeable fall from the southern part of the site towards the norther end.

3.4 Site Geology

The geology of the site was reviewed using data from the Geological Survey of Ireland (available at www.gsi.ie). The soil type at the location of the proposed development is identified as ‘Gravels derived from Limestones’ towards the northern end of the site and “Till derived from Limestones” towards the southern end of the site. The surrounding areas comprise mainly of ‘Bedrock outcrop or sub crop’ and “Till derived from Limestones”.

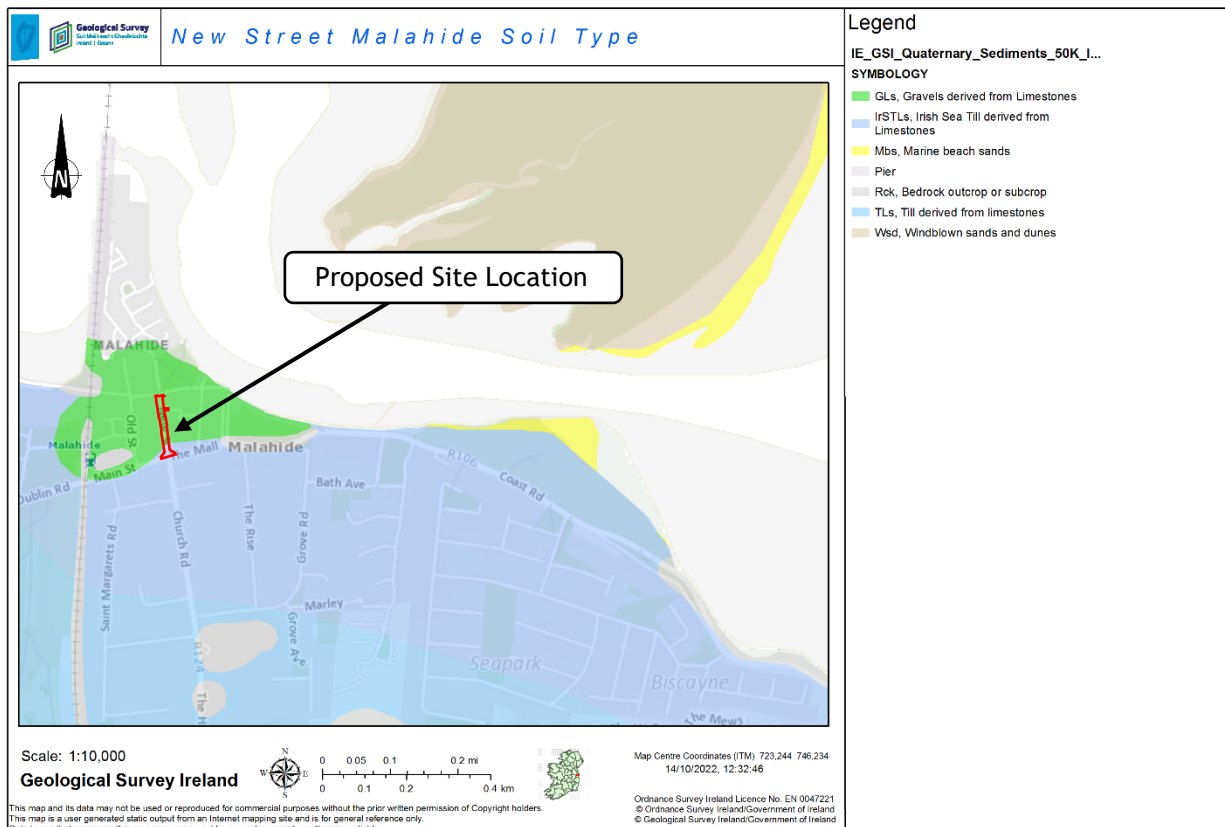


Figure 3-2: Geology of the surrounding area (source: Geological Survey of Ireland (<http://www.gsi.ie>))

3.5 Groundwater Flooding

GSI data show that the site is primarily within an area of extreme groundwater vulnerability as shown in the figure below.

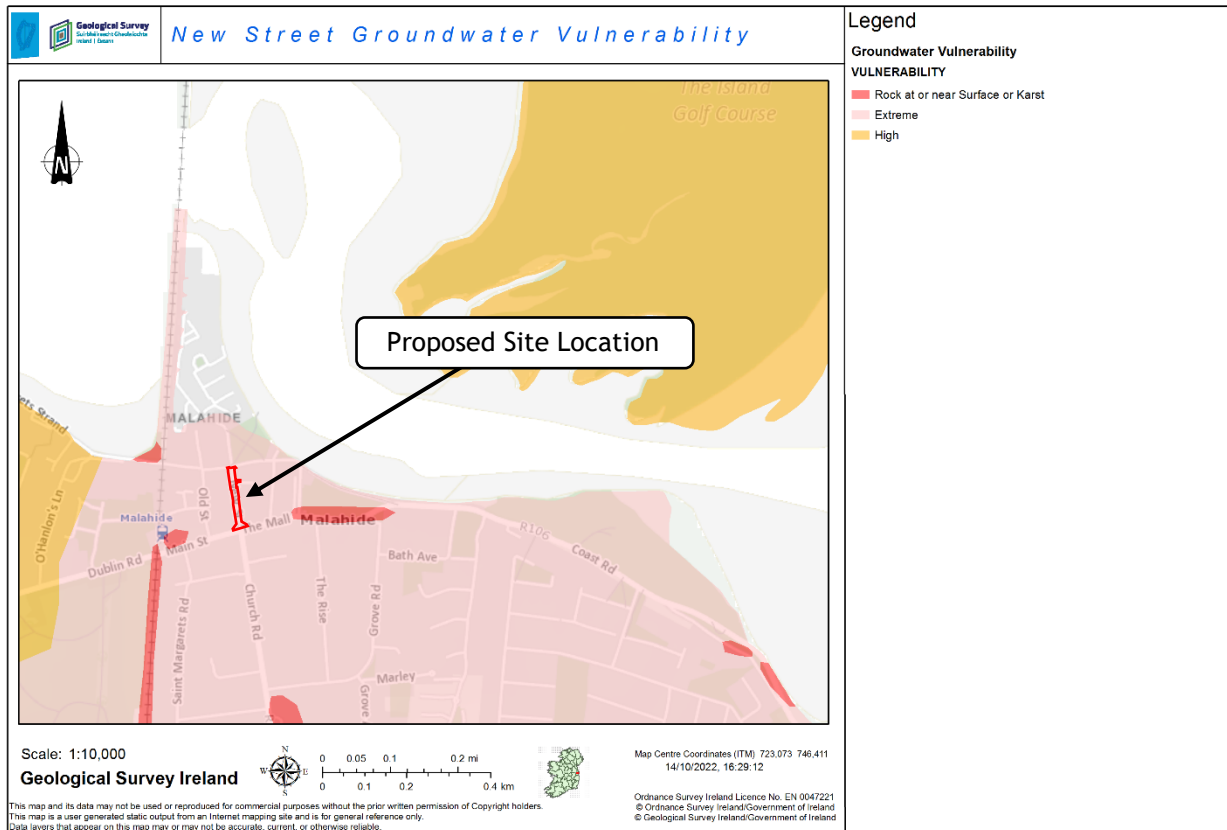


Figure 3-3: Groundwater Vulnerability (source: Geological Survey of Ireland (<http://www.gsi.ie>)).

3.6 Pluvial Flooding

Pluvial Flooding is the result of rainfall generated overland flows which arise before run-off can enter any watercourse or sewer. It is usually associated with high-intensity rainfall. The proposed site will include a surface water drainage system to ensure pluvial flooding does not occur. The development will also include SuDS measures such as bioretention areas which will reduce the overall pluvial flood risk.

3.7 Review of Existing Surface Water Infrastructure

Fingal County Council was contacted with regards existing surface water infrastructure in the vicinity of the site. the following stormwater drainage networks are present within the development site:

1. 225mm stormwater piped concrete sewer flowing south-north on New Street.

The following stormwater drainage exists adjacent to the development site:

1. 225mm stormwater piped concrete sewer flowing west-east on Strand Street

Please refer to Figure 3-4 illustrating the existing stormwater drainage arrangement.

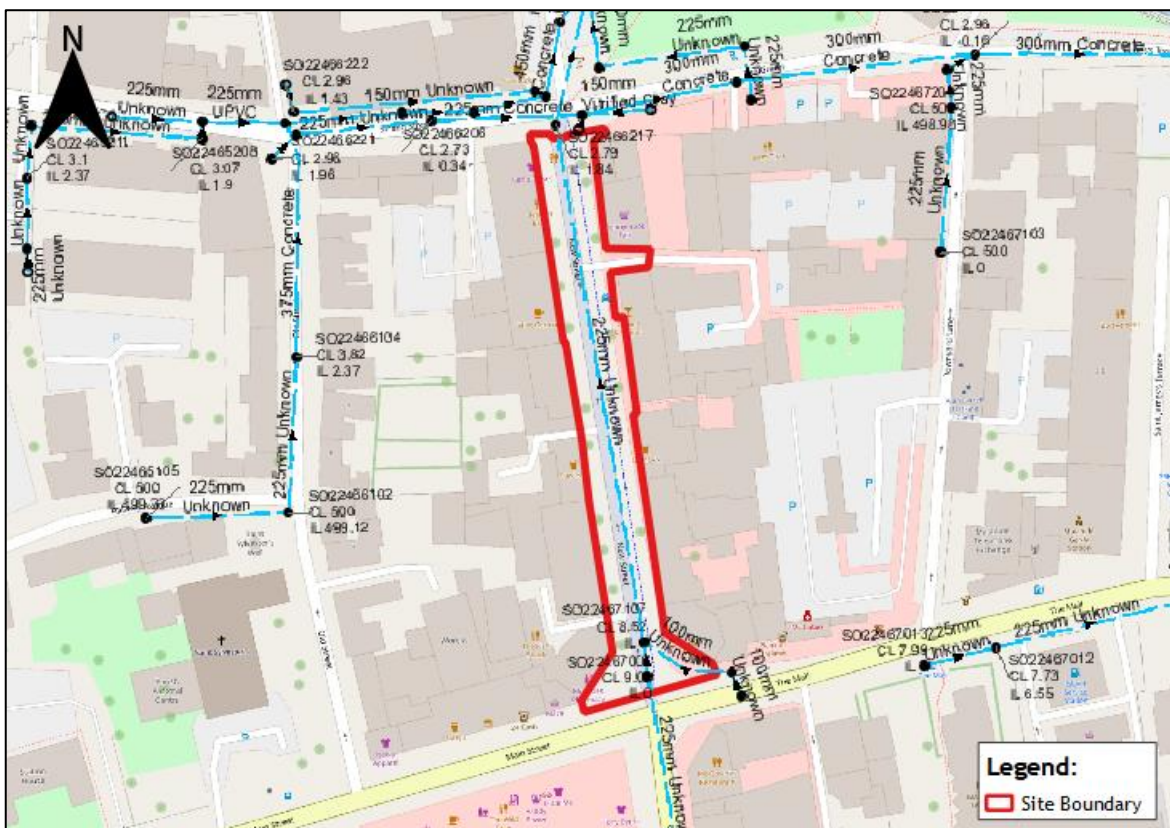


Figure 3-4: Existing stormwater drainage surrounding the site.

3.8 Review of Historic Mapping

A review of the OSI Historical maps¹ was carried out. Figure 3-5 shows an extract from the 25-inch historic map for the site. The site is not indicated as “liable to flood” in the available historic OSI maps.

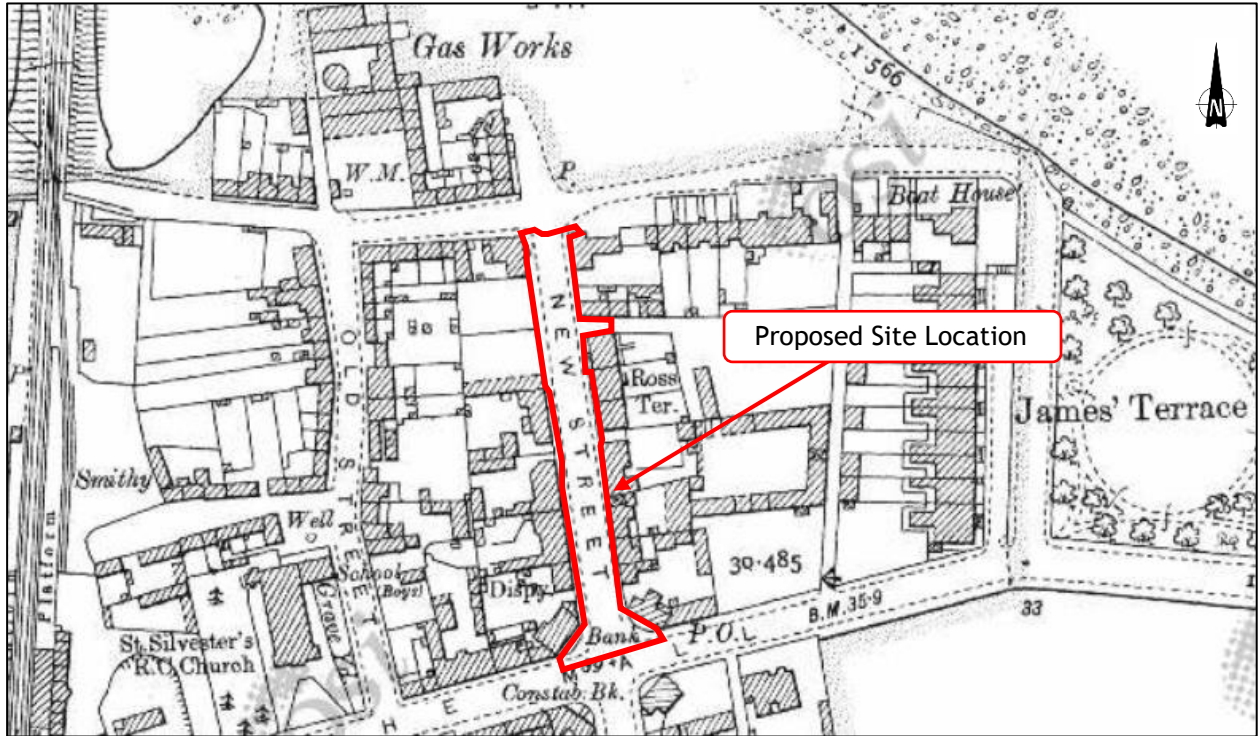


Figure 3-5: Extract from OSI historical 25-inch map.

¹ Maps available: <http://map.geohive.ie/mapviewer.html>

3.9 History of Flooding

The Office of Public Works (OPW) Flood Hazard Mapping website holds a record of historic flood events. A review of the database indicated that there have been no instances of flooding on the proposed site as shown in Figure 3-6, see Appendix B for full report.

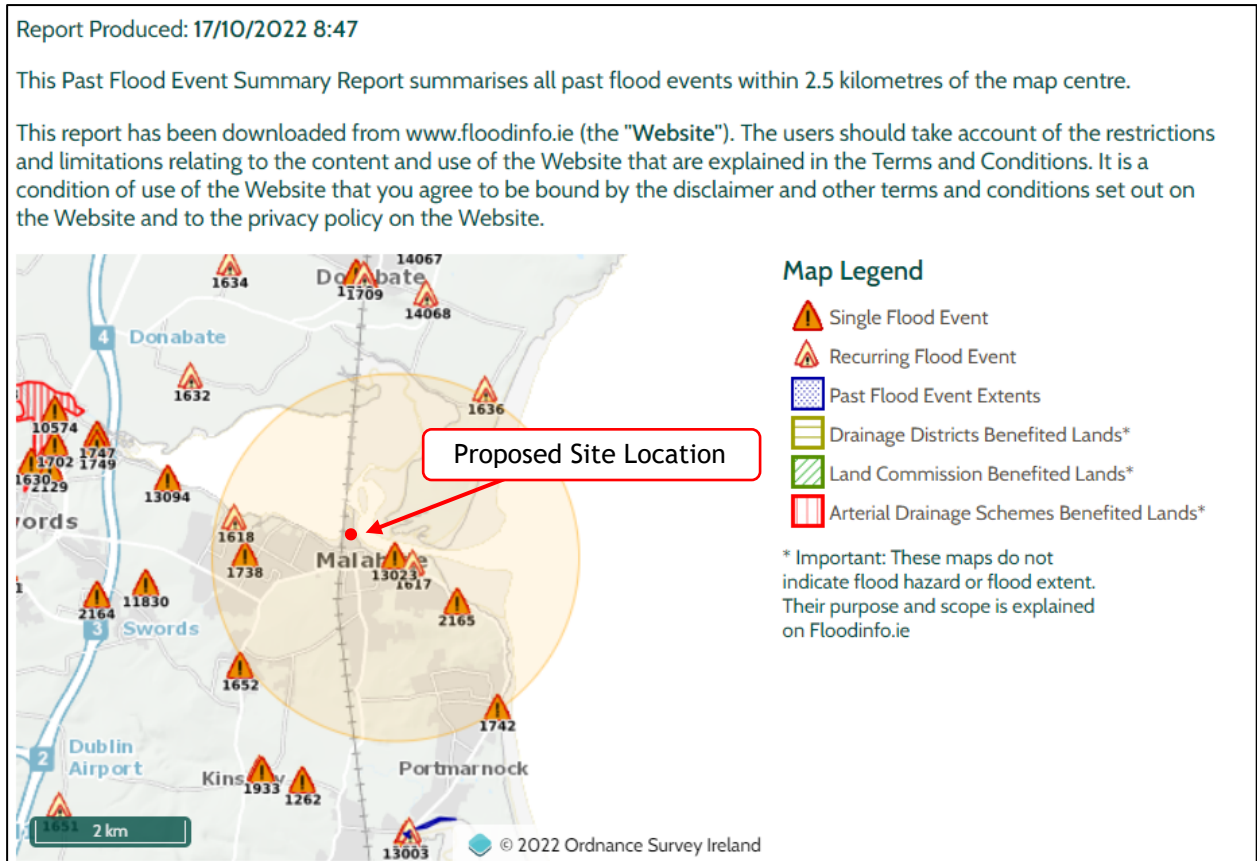


Figure 3-6: Extract from OPW Flood maps Database Report (see Appendix B for full report)

Please note that this is not a guaranteed record of all flood events.

3.10 Catchment Flood Risk Assessment and Management Study (CFRAMS) Mapping

The CFRAMS is an OPW led national programme which seeks to identify and map potential existing and future flood hazard in areas at significant risk from flooding. It also aims to identify flood relief measures and prepare Flood Risk Management Plans for these areas.

As part of the CFRAMS programme, mapping is available online for public viewing, and the local area has been assessed as part of the Eastern CFRAMS. The OPW has published detailed flood hazard mapping for the area based on results from the CFRAMS. This includes flood extent and flood depth mapping for a number of return periods for fluvial and coastal flood events. The CFRAMS mapping for the Malahide area is currently “Under Review” on the OPW website and is therefore unavailable for use in this study.

3.11 Fingal Development Plan 2023 - 2029 - SFRA

The Strategic Flood Risk Assessment (SFRA) prepared to accompany the Fingal Development Plan 2023-2029 provides flood risk maps for the area

Figure 3-7 below is an extract from the relevant SFRA Fluvial Flood Map. Full SFRA Mapping for the area are included in Appendix C of this report.

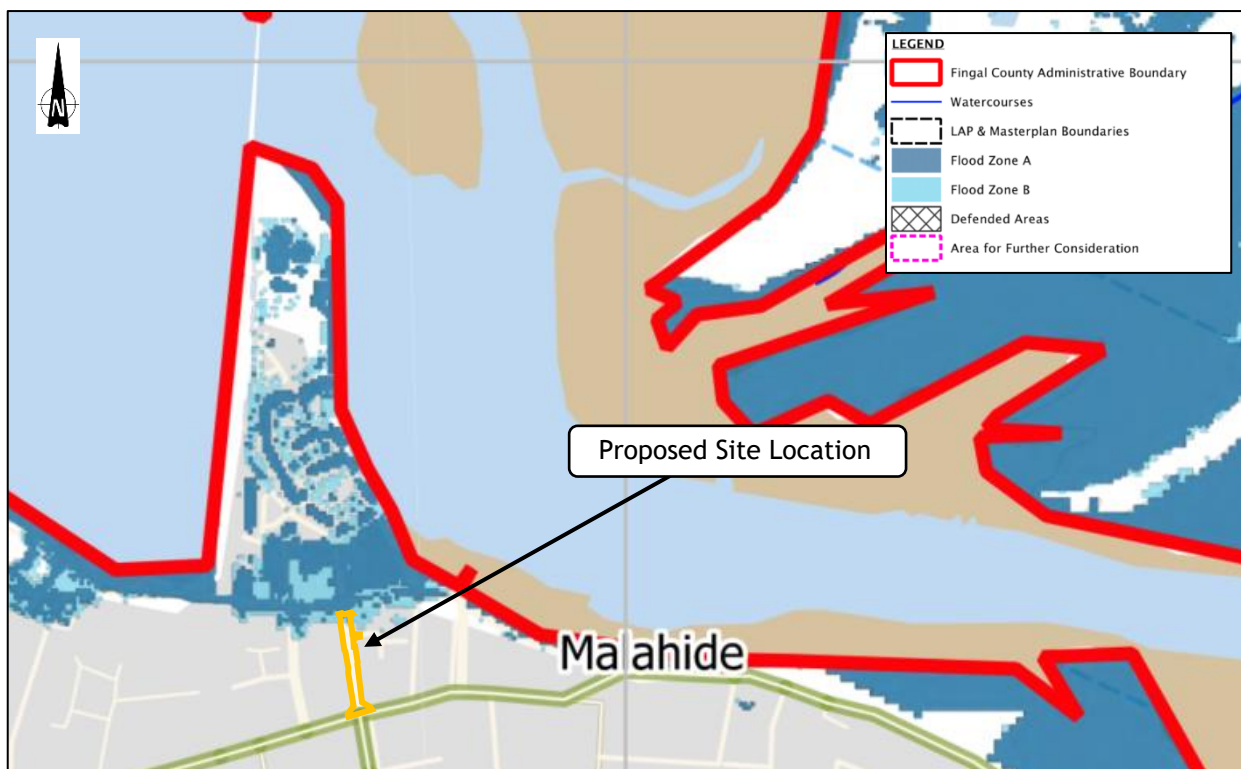


Figure 3-7: Extract from the SFRA Flood Map for the area (site indicated in orange), sourced from the Strategic Flood Risk Assessment (SFRA) for the Fingal Development Plan 2023-2029

The flood map above demonstrates that the majority of the site is not at risk of flooding. However, a small section of New Street towards the northern border of the site at the junction with Strand Street is within Flood Zone A.

3.12 Estimate of Flood Zone

PUNCH Consulting Engineers have reviewed the available information as outlined in the above sections. We have concluded that the northern extent of the site is located in Flood Zone A and is therefore at risk of flooding.

3.13 Vulnerability Classification

As part of this planning submission, table 3.1 of “The Planning System and Flood Risk Management” Guidelines was consulted. This table provides a broad classification of land use and vulnerability class. The proposed street can be classified “Amenity Open Space” and as such is considered a Water Compatible Development.

As part of this planning submission, Table 3.2 of “The Planning System and Flood Risk Management” Guidelines was consulted. This table provides a matrix of vulnerability versus flood zone and is reproduced here as Table 3-1. With reference to this table, it is concluded that the proposed street is considered appropriate within Flood Zone A.

Table 3-1: Matrix of Vulnerability versus Flood Zone to indicate Justification Requirement.

	Flood Zone A	Flood Zone B	Flood Zone C
Highly vulnerable development	Justification Test	Justification Test	Appropriate
Less vulnerable development	Justification Test	Appropriate	Appropriate
Water-compatible development	Appropriate	Appropriate	Appropriate

3.14 Flood Impact Assessment of the Proposed Public Realm Improvements

There are a number of potential aspects to consider when assessing if the proposed development will increase the flood risk elsewhere.

- i. Loss of flood storage - Not applicable
- ii. Diversion of flood waters - Not Applicable
- iii. Increased runoff from the proposed development - Not applicable

Flood storage and flow paths in the area will be unaffected due to the proposed New Street Ground levels will be maintained at the existing ground levels as much as possible. Flow paths in extreme flood events will have the same flow pattern as existing.

The majority of the current site has impermeable surfaces, and SUDs measures will be introduced as part of the proposed development. The result of this is that the runoff rate from the development will be reduced in the proposed scenario when compared to the existing scenario.

4 Flood Risk Assessment Conclusions

This report was prepared to accompany a planning submission to Fingal County Council (FCC) for the proposed public realm improvements at New Street, located in Malahide, Co. Dublin.

As part of this planning submission, the proposed redevelopment of New Street has been assessed in accordance with “The Planning System and Flood Risk Management” Guidelines and FCC’s Development Plan 2023-2029. It was determined that the proposed public realm improvement to a pedestrianised New Street is currently located within Flood Zone A for fluvial flooding. The proposed public realm improvement to a pedestrianised New Street is classified as a Water Compatible Development under “The Planning Scheme and Flood Risk Management” Guidelines and as such is considered appropriate in this location. The proposed public realm improvement to a pedestrianised New Street will not increase the flood risk elsewhere.

Appendix A Site Visit Images



Image 1: Existing site access from junction between Strand Street and New Street.



Image 2: View of New Street (looking southwards along the street).



Image 3: Existing site access from junction between The Mall (R106) and New Street.



Image 4: View of New Street (looking northwards along the street).



Image 5: Existing gullies present along New Street.

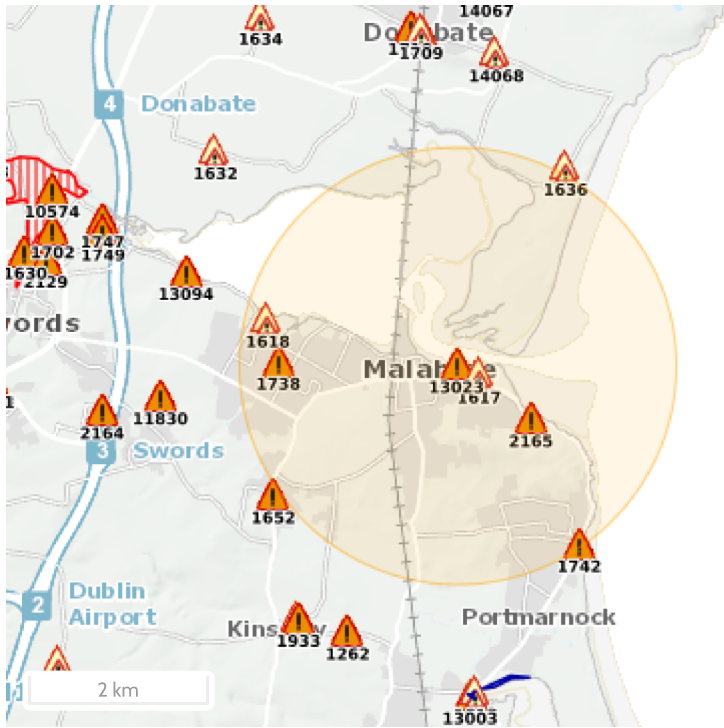
Appendix B OPW Historic Flood Events Record



Report Produced: 17/10/2022 8:47

This Past Flood Event Summary Report summarises all past flood events within 2.5 kilometres of the map centre.

This report has been downloaded from www.floodinfo.ie (the "Website"). The users should take account of the restrictions and limitations relating to the content and use of the Website that are explained in the Terms and Conditions. It is a condition of use of the Website that you agree to be bound by the disclaimer and other terms and conditions set out on the Website and to the privacy policy on the Website.



Map Legend

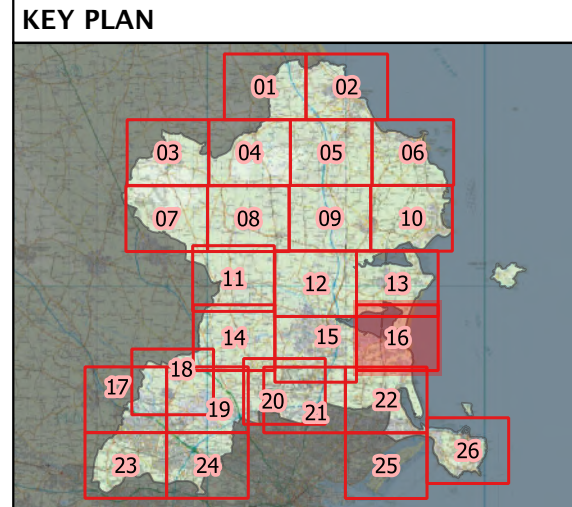
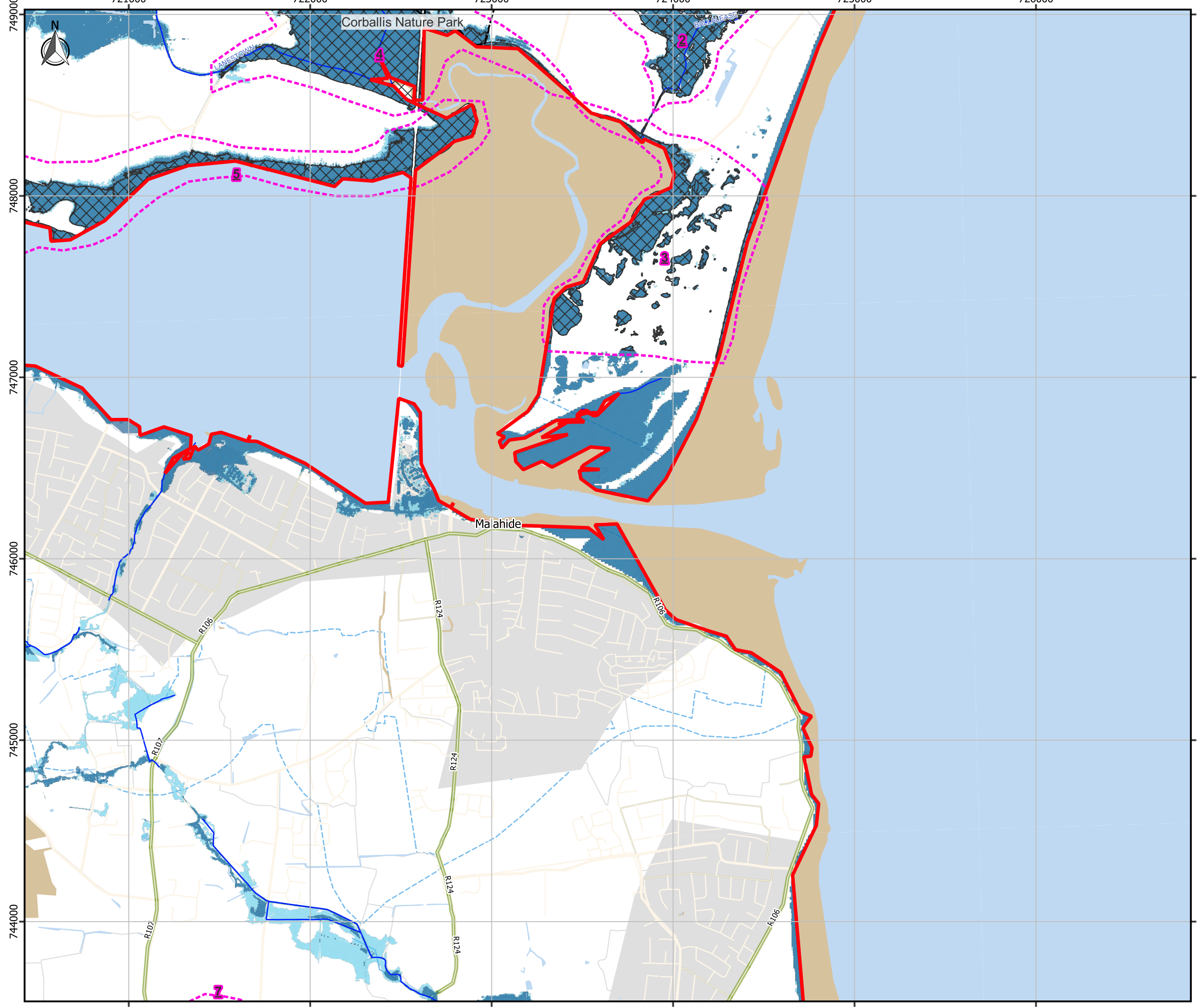
- Single Flood Event
- Recurring Flood Event
- Past Flood Event Extents
- Drainage Districts Benefited Lands*
- Land Commission Benefited Lands*
- Arterial Drainage Schemes Benefited Lands*

* Important: These maps do not indicate flood hazard or flood extent. Their purpose and scope is explained on Floodinfo.ie

6 Results

Name (Flood_ID)	Start Date	Event Location
1. Mill View Lawn Malahide Feb 2002 (ID-1738) Additional Information: Reports (1) , Press Archive (0)	01/02/2002	Exact Point
2. Strand Road Malahide Feb 2002 (ID-1742) Additional Information: Reports (1) , Press Archive (0)	01/02/2002	Approximate Point
3. Biscayne Coast Road Malahide Oct 2002 (ID-2165) Additional Information: Reports (1) , Press Archive (0)	19/10/2002	Exact Point
4. Flooding at Malahide on 03/01/2014 (ID-13023) Additional Information: Reports (0) , Press Archive (0)	03/01/2014	Approximate Point
5. Seabank (Estate) Court Malahide Recurring (ID-1617) Additional Information: Reports (5) , Press Archive (0)	n/a	Exact Point
6. Bisset Strand and Estuary Road Malahide Recurring (ID-1618) Additional Information: Reports (4) , Press Archive (0)	n/a	Exact Point

Appendix C SFRA Mapping



LEGEND

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

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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

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MAP SERIES: PAGE 16 OF 26

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