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Site Specific Flood Risk Assessment

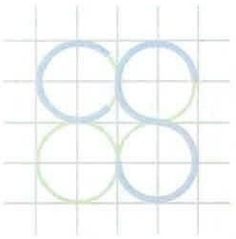
Proposed Housing Development

Main Street, Newcastle, Co. Dublin

Client: Deane & Deane Ltd

Job No. D098

June 2022



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SITE SPECIFIC FLOOD RISK ASSESSMENT

PROPOSED HOUSING DEVELOPMENT, MAIN STREET, NEWCASTLE, CO. DUBLIN

CONTENTS

File Location: j:\d_jobs\job-d098\b_documents\civil\a_cs reports\ssfra\d098-csc-zz-xx-rp-c-0002_ssfra.docx

BS 1192 FIELD	**NCA-CSC-ZZ-XX-RP-C-0002_SSFRA**

Job Ref.	Author	Reviewed By	Authorised By	Issue Date	Rev. No.
D098	LJ	SS	OS	10-06-2022	P1
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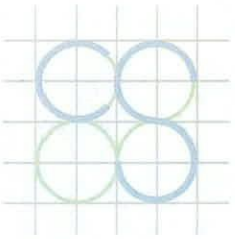

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1.0 INTRODUCTION

Cronin & Sutton Consulting Engineers (CS Consulting) have been commissioned by Deane & Deane Ltd to prepare Site Specific Flood Risk Assessment for a Proposed Housing Development at Main Street, Newcastle, Co. Dublin.

In preparing this report, CS Consulting has made reference to the following:

- South Dublin Development Plan 2016–2022;
  (including Strategic Flood Risk Assessment)
- Draft South Dublin Development Plan 2022–2028;
  (including Strategic Flood Risk Assessment)
- Greater Dublin regional Code of Practice for Drainage Works;
- Office of Public Works Flood Maps;
- Department of the Environment Flooding Guidelines;
- Geological Survey of Ireland Maps;
- Local Authority Drainage Records.

The Flood Risk Assessment is to be read in conjunction with the engineering drawings and documents submitted by CS Consulting and with the various additional information submitted by the other members of the design team, as part of the Planning Submission.

2.0 SITE LOCATION AND PROPOSED DEVELOPMENT

2.1 Site Location

The site of the proposed development lies along Main Street, Newcastle. The site has a total area of approx. 1.3ha and is located in the administrative jurisdiction of South Dublin County Council.

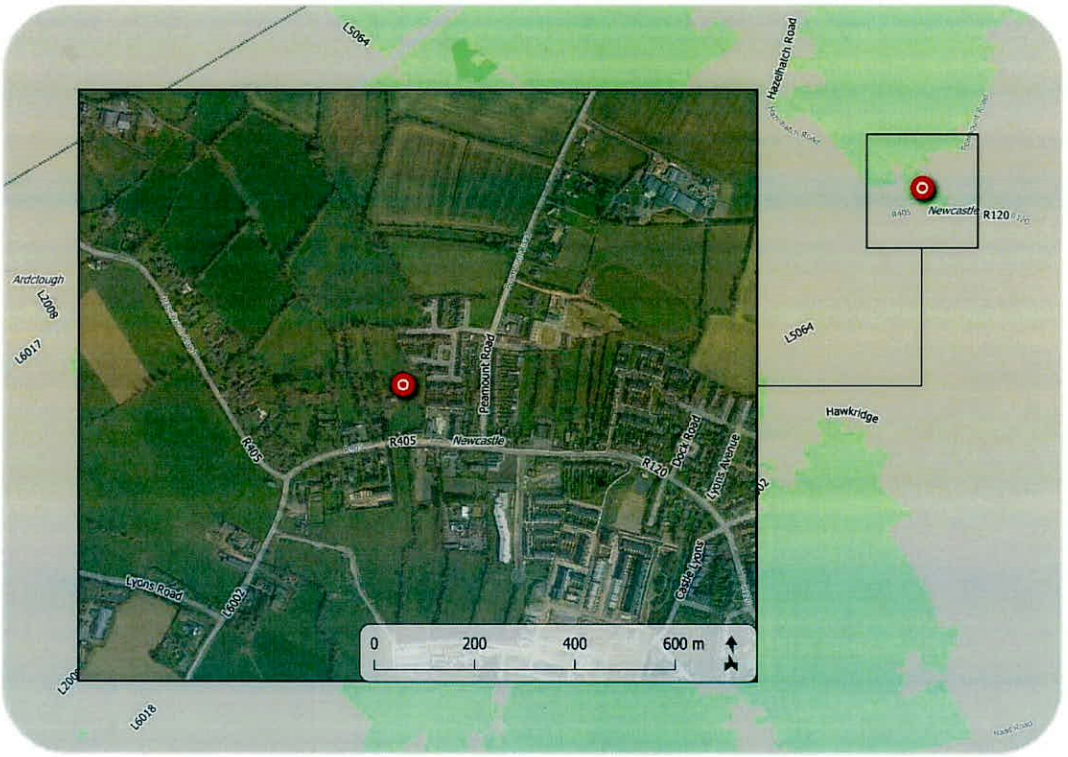


Figure 1 – Location of proposed development site
(map data & imagery: EPA, NTA, OSM Contributors, Google)

The location of the proposed development site is shown in Figure 1 above; the indicative extents of the development site, as well as relevant elements of the surrounding road network, are shown in more detail in Figure 2.

The site is bounded to the south by St. Finian's Community Hall, southwest, and east by residential and commercial properties. It is bounded to the north and west by greenfields.

Figure 2 – Indicative site extents
(map data & imagery: NTA, SDCC, OSM Contributors, Google)

2.2 Existing Site Condition

The subject site comprises of 2no. sheds with a footprint of 850m^2.

2.3 Description of the Proposed Development

The proposed development will consist of the demolition of 2 no. sheds and the construction of 30 no. dwellings, 1 no. vehicular and pedestrian link with Main Street, Newcastle, 1 no. vehicular and pedestrian link with Glebe Square Newcastle, 1no. pedestrian only link with Market Square to the east, and all associated and ancillary site development works.

3.0 LEVEL OF SERVICE

There is an existing inherent risk of any flood event occurring during any given year. Typically, this likelihood of occurrence was traditionally expressed as a 1-in-100 chance of a 100-year storm event happening in any given year.

A less ambiguous expression of probability is the Annual Exceedance Probability (AEP), which may be defined as the probability of a flood event being exceeded in any given year. Therefore a 1-in-100-year event has a return period of 1% AEP flood event, similarly a 100% AEP can be expressed as a 1-in-1-year event.

The Planning System and Flood Risk Management, Guidelines for Planning Authorities (Flood Risk Management Guidelines), published in 2009 set out the best practice standards for flood risk assessment in Ireland. These are summarised in Table 1 below (Table 8.1 from Flood Risk Management Guidelines document).

Table 1 – Summary of Level of Service: Flooding Source

Development Category	Flooding Source		
	Drainage	River	Tidal/Coastal
Residential	1% AEP	0.1% AEP	0.1% AEP
Commercial	1% AEP	1% AEP	0.5% AEP
Water-compatible (docks, marinas)	-	>1% AEP	>0.5% AEP

Under these guidelines a proposed development site has first to be assessed to determine the flood zone category it falls under.

It is a requirement of South Dublin City Council, the *Greater Dublin Strategic Drainage Study* (DCC 2005), and the Flood Risk Management Guidelines

that the predicted effects of climate change are incorporated into any proposed design. Table 2 below indicates the predicted climate change variations.

Table 2 – Predicted climate change variations

Design Category	Predicted Impact of Climate Change
Drainage	20% Increase in rainfall
Fluvial (river flows)	20% Increase in flood flow
Tidal / Coastal	Minimum Finished Floor Level 4.0 – 4.15m AOD

The flooding guidelines categorise the risks associated with flooding into three areas, Zone A, B & C. This categorisation is indicated below.

- **Zone A** – High Probability of Flooding. Where the average probability of flooding from rivers and sea is highest (greater than 1% annually or 1 in 100 for river flooding or 0.5% annually or 1 in 200 for coastal flooding).
- **Zone B** – Moderate Probability of Flooding. Where the average probability of flooding from rivers and sea is moderate (risk between 0.1% annually or 1 in 1000 years and 1% annually or 1 in 100 years for river flooding, and between 0.1% or 1 in 1000 years and 0.5% annually or 1 in 200 for coastal flooding).
- **Zone C** – Low Probability of Flooding. Where the probability of flooding from rivers and sea is moderate (risk is less than 0.1% annually or 1 in 1000 years for both rivers and coastal flooding).

  In accordance with the Flood Risk Management Guidelines, dwellings are classified as 'highly vulnerable developments'.

  A review of SDCC flood risk mapping shows the subject site to be located in Flood Zone C. See **Appendix A.**

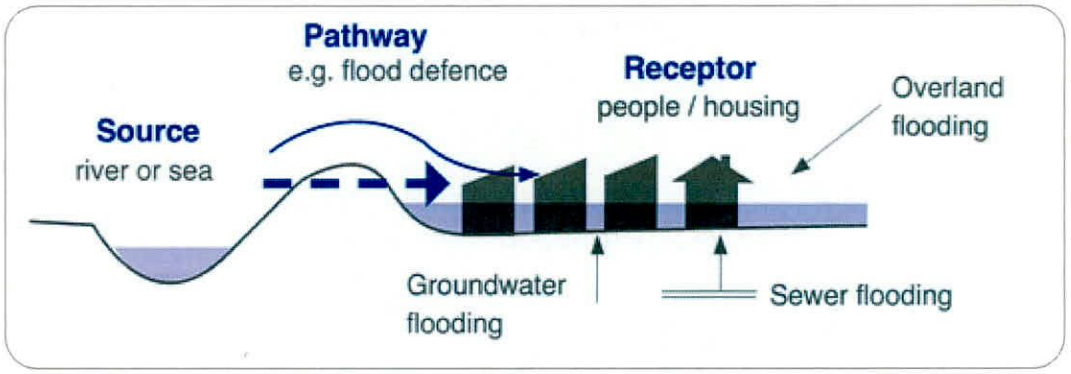


Figure 1 – Source-pathway-receptor model
(*The Planning System and Flood Risk Management Guidelines*)

The Flood Risk Management Guidelines have developed an 'appropriateness' matrix for various developments and their potential risk factor. The table indicates if further analysis is required in the form of a justification test. Table 3 below outlines the conditions that require a justification test.

Table 3 – Flood Zone vs. Justification Test Matrix

Development Category	Flood Zone A	Flood Zone B	Flood Zone C
Highly Vulnerable Development	***Justification Test Required***	***Justification Test Required***	Appropriate
Less Vulnerable Development	***Justification Test Required***	Appropriate	Appropriate
Water-compatible Development	Appropriate	Appropriate	Appropriate

As noted above the site is located within **Flood Zone C**, as such a justification test is not required.

4.0 FLOOD RISK AND MITIGATION MEASURES

4.1 Fluvial Flooding

A review of the Office of Public Works flood maps database, www.floodmaps.ie, for the area does not indicate historical flooding at the site. See the OPW Map-report included in **Appendix B**.

Therefore, the risk of fluvial flooding is not an issue, and no mitigation measures are required.

4.2 Tidal Flooding

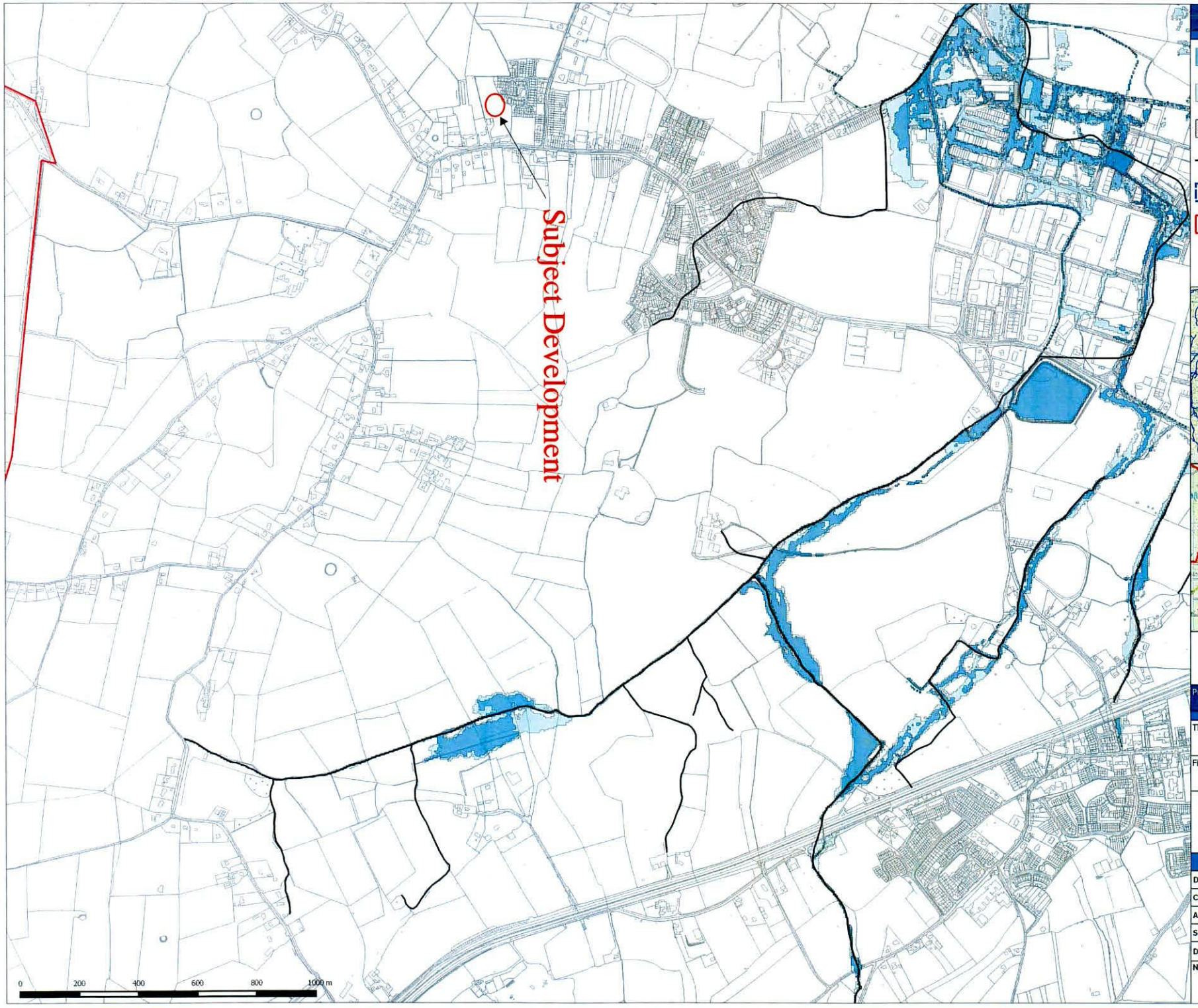
The development site's location is such that it is not affected by tidal water bodies and as such tidal flooding is negligible.

4.3 Pluvial Flooding

Pluvial flooding is flooding which has originated from overland flow resulting from high intensity rain fall. From a review of the OPW flood maps there are no records of flood events due to high rainfall events in the area and assessing the local topography we understand the risk of fluvial flooding to the site is negligible and the development site is deemed not to be at risk from pluvial flooding.

However, the proposed site development will be fitted with an attenuation system limiting storm water run-off to 2.7 l/s and on-site storage provided for the 1-in-100-year extreme storm event increased by 20% for the predicated effects of climate change. By reducing the run-off from the site into the local authority surface water sewer the potential risk of flooding from pluvial action is deemed to be within acceptable limits.

Appendix A: SDCC Flood Maps



Legend

- Flood Zone A - 1% AEP Flood Extent (1 in 100 chance in any given year)
- Flood Zone B - 1% AEP Flood Extent (1 in 1000 chance in any given year)
- Defended Area
- Watercourse Centreline
- Indicative Flood Extents
- County Boundary

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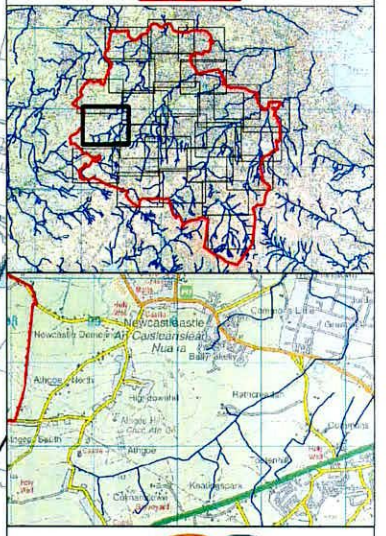

Comhairle Contae Átha Cliath Theas
South Dublin County Council

Project: Strategic Flood Risk Assessment

Title: Fluvial Flood Zone Mapping

Figure: MDW657_0013

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Issue Details

Drawn:	BT	Project No.	MDW0657
Checked:	JH	File Ref	MDW0657QG0010F02
Approved:	JH		
Scale:	1:6000 @ A1	Drawing No.	Projection
Date:	14/01/2016	13 of 26	IG

Notes
1. The viewer of this map should refer to the SFRA Report and Disclaimer

Appendix B: OPW Historic Flood Maps

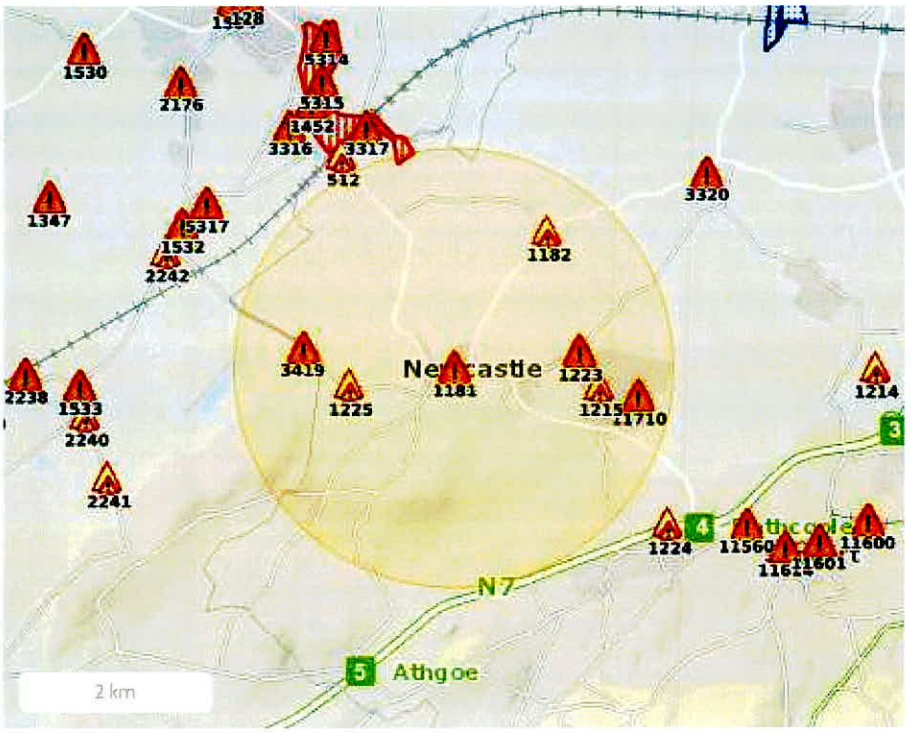
Past Flood Event Local Area Summary Report

OPW Oifig na nOibreacha Poibli Office of Public Works

Report Produced: 13/4/2022 14:40

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

9 Results

	Name (Flood_ID)	Start Date	Event Location
1.	Newcastle Glebe Dublin Recurring (ID-1181)	n/a	Approximate Point
	Additional Information: Reports (2) Press Archive (0)		
2.	Peamount Road Recurring (ID-1182)	n/a	Approximate Point
	Additional Information: Reports (2) Press Archive (1)		
3.	Newcastle Greenoge Recurring (ID-1215)	n/a	Approximate Point
	Additional Information: Reports (2) Press Archive (0)		
4.	Aylmer Road Newcastle recurring (ID-1223)	n/a	Approximate Point
	Additional Information: Reports (2) Press Archive (1)		
5.	Aylmer Road Newcastle Nov 2000 (ID-3319)	05/11/2000	Approximate Point
	Additional Information: Reports (2) Press Archive (1)		
6.	Newcastle village Nov 2000 (ID-3325)	05/11/2000	Approximate Point
	Additional Information: Reports (1) Press Archive (0)		

	Name (Flood_ID)	Start Date	Event Location
7.	Lyons Demesne Access Nov 2000 (ID-3419) **Additional Information:** Reports (2) Press Archive (0)	05/11/2000	Approximate Point
8.	Lyons Road Recurring (ID-1225) **Additional Information:** Reports (2) Press Archive (0)	n/a	Approximate Point
9.	Flooding at Greenogue Business Park, Rathcoole, Co. Dublin on 24th Oct 2011 (ID-11710) **Additional Information:** Reports (1) Press Archive (0)	24/10/2011	Exact Point

Appendix C: GSI Maps

Geological Survey Ireland Public Data

Scale: 1:10,000

Geological Survey Ireland

PSI Licence

N S W E

0 0.05 0.1 0.2 mi

0 0.1 0.2 0.4 km

Map Centre Coordinates (ITM) 700,250 728,707

5/9/2022, 11:51:17 AM

Legend

Structural Symbols 100K ITM 2018

- Dip of bedding or main foliation, old GSI data
- First foliation parallel to bedding
- Foliation trend, Thorr and Rosses Granites
- Horizontal Bedding
- Strike and dip of bedding, right way up
- Strike and dip of bedding, way up unknown
- Strike and dip of first foliation
- Strike and dip of overturned bedding
- Strike and dip of second foliation
- Strike and dip of third foliation
- Strike and plunge of first generation fold axis
- Strike and plunge of second generation fold axis
- Strike and plunge of third generation fold axis
- Strike of vertical bedding/foliation
- Strike of vertical first foliation
- <all other values>

Bedrock Outcrops 100 ITM 2018

Bedrock Linework 100k ITM 2018

- Anticlinal Axis
- Antiformal axis
- Aquifer Boundary
- Area
- Coal seam
- Dyke
- Fault
- Ghost Line
- Goniatite marine band (R1-R4)
- Lithological boundary offshore
- Metadolerite sheet, mainly sills
- Paleogene/ Tertiary Dyke
- Synclinal Axis
- Synformal axis
- Tectonic Slide, barbs on hanging-wall
- Thin stratigraphical unit, diagrammatic
- Thrust, barbs on hanging-wall side
- Tuff band
- Unconformity, dots on younger side
- X-Section