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Site Specific Flood Risk Assessment

Proposed Shared Living Development At Brady's Public House, Old Navan Road, Dublin 15

Client: Bartra Property (Castleknock) Limited

Job No. B094

August 2020

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SITE SPECIFIC FLOOD RISK ASSESSMENT

PROPOSED SHARED LIVING DEVELOPMENT AT BRADY'S PUBLIC HOUSE, OLD NAVAN ROAD, DUBLIN 15

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B094	GS	GL	GL	24.10.2018	-
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B094	GS	GL	GL	26.08.2019	B
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1.0 INTRODUCTION

Cronin & Sutton Consulting Engineers (CS Consulting) have been commissioned by Bartra Property (Castleknock) Limited, to prepare a Site Specific Flood Risk Assessment to accompany a planning application for a shared living development at Brady's Public House, Old Navan Road, Dublin 15.

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

- Fingal County Council Development Plan 2017–2023;
  (including Strategic Flood Risk Assessment)
- Greater Dublin regional Code of Practice for Works;
- Office of Public Works Flood Maps;
- Department of the Environment Flooding Guidelines;
- Geological Survey of Ireland Maps;
- Local Authority Drainage Records.

The Site Specific 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 is located in a residential area with the N3 and M50 roads nearby to the north and east and the Royal Canal located to the south. The site is bounded by the Old Navan Road to the south, public amenity space to the north, Talbot Downs road to the west and a residential private property to the east. On the site there is an existing two-storey over basement public house with a restaurant on the first floor, which closed in March 2020. The remaining site consists mostly of paved parking that served the public house and restaurant. The site is located in the administrative jurisdiction of Fingal County Council and has a total area of circa 0.317 ha.

Figure 1 – Site location
(image: Google)

The existing building is located to the north-west of the site and has a gross floor area of c. 1,243 m2. The structure is approximately 10.5m in height with a curved arching roof broken up by a central glazed atrium.

2.2 Proposed Development

Bartra Property (Castleknock) Limited intend to apply to An Bord Pleanála for permission for a strategic housing development at this 0.3,170 ha site at Brady's Public House, Old Navan Road, Dublin 15, D15 W3FW.

The development will principally consist of: the demolition of the existing part 1 to part 2 No. storey over partial basement public house and restaurant building (1,243 m2) and the construction of a part 1 to part 5 No. storey over basement Build-to-Rent Shared Living Residential Development (6,549 m2) comprising 210 No. bedspaces (182 No. single occupancy rooms, 4 No. accessible rooms and 12 No. double occupancy rooms).

The development also consists of the provision of communal living/kitchen/dining rooms at each floor level to serve the residents of each floor; communal resident amenity spaces for all residents including tv/cinema room at basement level, gymnasium and lounge/reception area at ground floor level, a library/study at third floor level and a private dining room at fourth floor level; external roof terrace at third floor level (78m2) facing north-east, north-west and south-west; external communal amenity courtyards at basement (170 m2) and ground floor level (336 m2); external amenity space at basement level accessed from the communal living/kitchen/dining room (30 m2); balconies at third floor level facing north-east (13.8 m2); resident facilities including launderette, linen store, accessible WC and bin store; 2 No. accesses to the public park along the north-eastern boundary; 2 No. car-share parking spaces; a lay-by and delivery bay; emergency gate access to the courtyard (north-west boundary); bicycle parking; boundary treatments; hard and soft

landscaping; plant; PV panels; substation; switch room; generator; lighting; and all other associated site works above and below ground.

The proposed development shall be constructed in one phase.

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 the chance of a 1-in-100 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 1% AEP, similarly a 100% AEP can be expressed as a 1-in-1-year event.

3.1 *The Planning System and Flood Risk Management, Guidelines for Planning Authorities* set out the best practice standards for flood risk assessment in Ireland. These are summarised in **Table 1.0** below.

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

Table 1.0: Summary of Level of Service – Flooding Source.

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

3.2 It is a requirement of both Fingal County Council's, *Greater Dublin Strategic Drainage Study* (DCC 2005) and the Department of the Environment, community & Local Government flooding guidelines, *The Planning System and Flood Risk Management, Guidelines for Planning Authorities,* that the predicted effects of climate change are incorporated into any proposed design. **Table 2.0** below indicates the 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

Table 2.0 The predicted climate change variations.

3.3 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 *Planning Systems and Flood Risk Management Guidelines for Planning Authorities*, dwelling houses are classified as 'highly vulnerable developments'.

3.4 Reviewing the Fingal County Council flood maps, ***the subject site is located in Flood Zone C***. See **Appendix A** and Figure 3.

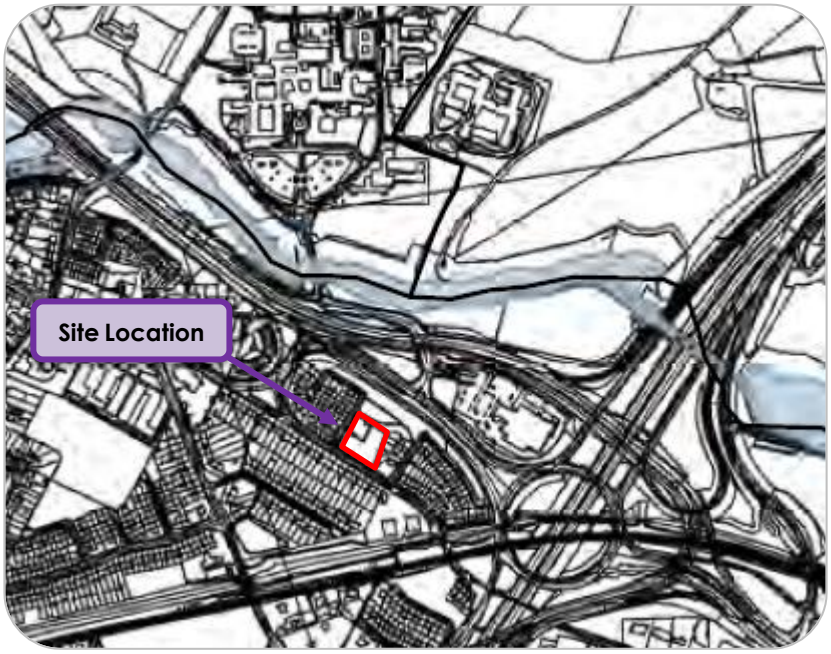

Figure 3 — Flood Zone Mapping
(Fingal County Council Strategic Flood Risk Assessment)

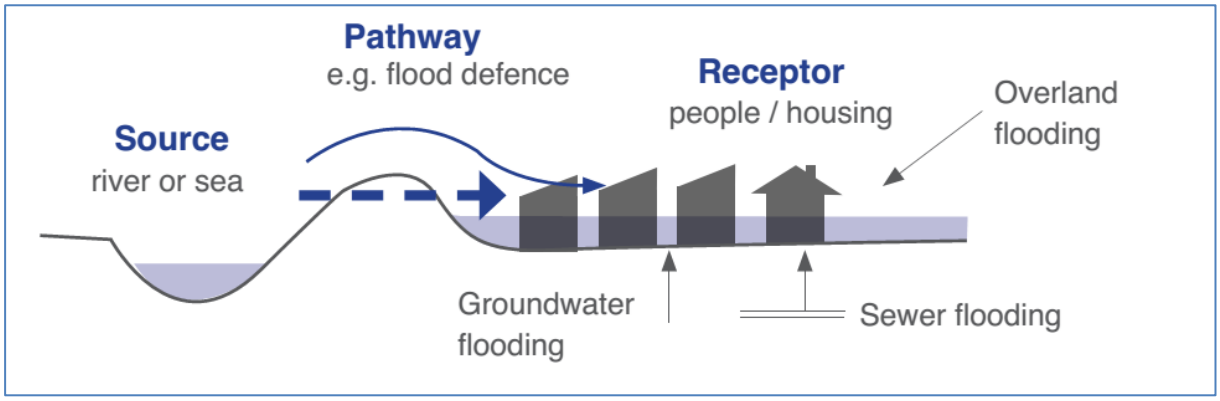

Figure 4 – Source-pathway-receptor model
(The Planning System and Flood Risk Management Guidelines)

3.5 The flooding 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 3.0 below outlines the conditions that require a justification test.

	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

Table 3 - Flood Zone Vs Justification Test Matrix

As noted previously ***the proposed development is located within Flood Zone C***. As such a justification test is not required.

4.0 FLOOD RISKS & MITIGATION MEASURES

4.1 Fluvial Flooding

The site is located approximately 150 m to the south from the Royal Canal and 203 m to the north from the River Tolka. 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 sites location is such that it is not affected by tidal water bodies and as such tidal flooding is not applicable.

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. See **Appendix B** for OPW Flood maps Report.

However, the proposed site development will be fitted with an attenuation system limiting storm water run-off to 2 l/s and on site storage provided for the 1 in 100 year extreme storm event increased by 20% for the predicted effects of climate change. By reducing the run-off from the site into the local authority surface water network the potential risk of flooding from pluvial action is mitigated.

4.4 Potential For Site To Contribute To Off-Site Flooding.

The proposed development will require attenuation to be provided. The attenuation tank will be sized for a 1 in 100 year extreme storm event increased by 20% for the predicted effects of climate change. The attenuation will release the storm water in a controlled manner after the peak storm duration has passed. By restricting the flow, the likelihood of the proposed development adversely affecting the public drainage system or contributing to downstream flooding is mitigated. Please refer to Engineering Services Report (under separate cover) and drawings B094-001 and B091-002 for attenuation details.

4.5 Existing Off Site Drainage

It is the understanding of CS Consulting that at present there are no issues with the local drainage arrangements. The subject land will discharge a restricted flow into the existing drain, thereby reducing the hydraulic pressure on the existing external network during extreme rainfall events.

4.6 Groundwater Flooding

According to the Geological Survey of Ireland, GSI, interactive maps, the subject site is underlain with *Calcareous shale, limestone conglomerate*. The area is listed as overlaying a locally poor aquifer which has bedrock which is *generally unproductive except for local zones*. The groundwater vulnerability assessment of the site shows that the vulnerability of groundwater in the area is *high*. The proposed alteration to the existing site will not increase the potential for groundwater flooding as such the risk is deemed acceptable. See **Appendix C** for GSI mapping information for background groundwater & geology data for the subject lands.

5.0 CONCLUSION

- The site historically has no recorded flood events as noted in the OPW's flood maps. The Fingal County Council's Strategic Flood Risk Assessment Maps has indicated that the subject lands are located outside the 0.1% AEP Zone.

- Predicted flood mapping for pluvial / tidal & Fluvial flood events will not affect the subject lands.

- The proposed development will have a storm water attenuation system to address a 1 in 100 year extreme storm events increased by 20% for predicted climate change values. This will significantly reduce the volume of storm water leaving the site during extreme storms which in turn will have the effect of reducing the pressure on the existing public drainage system.

- The likelihood of onsite flooding from the hydrogeological ground conditions are deemed to be minor and within acceptable levels.

Appendix A

Fingal County Council's Flood Maps

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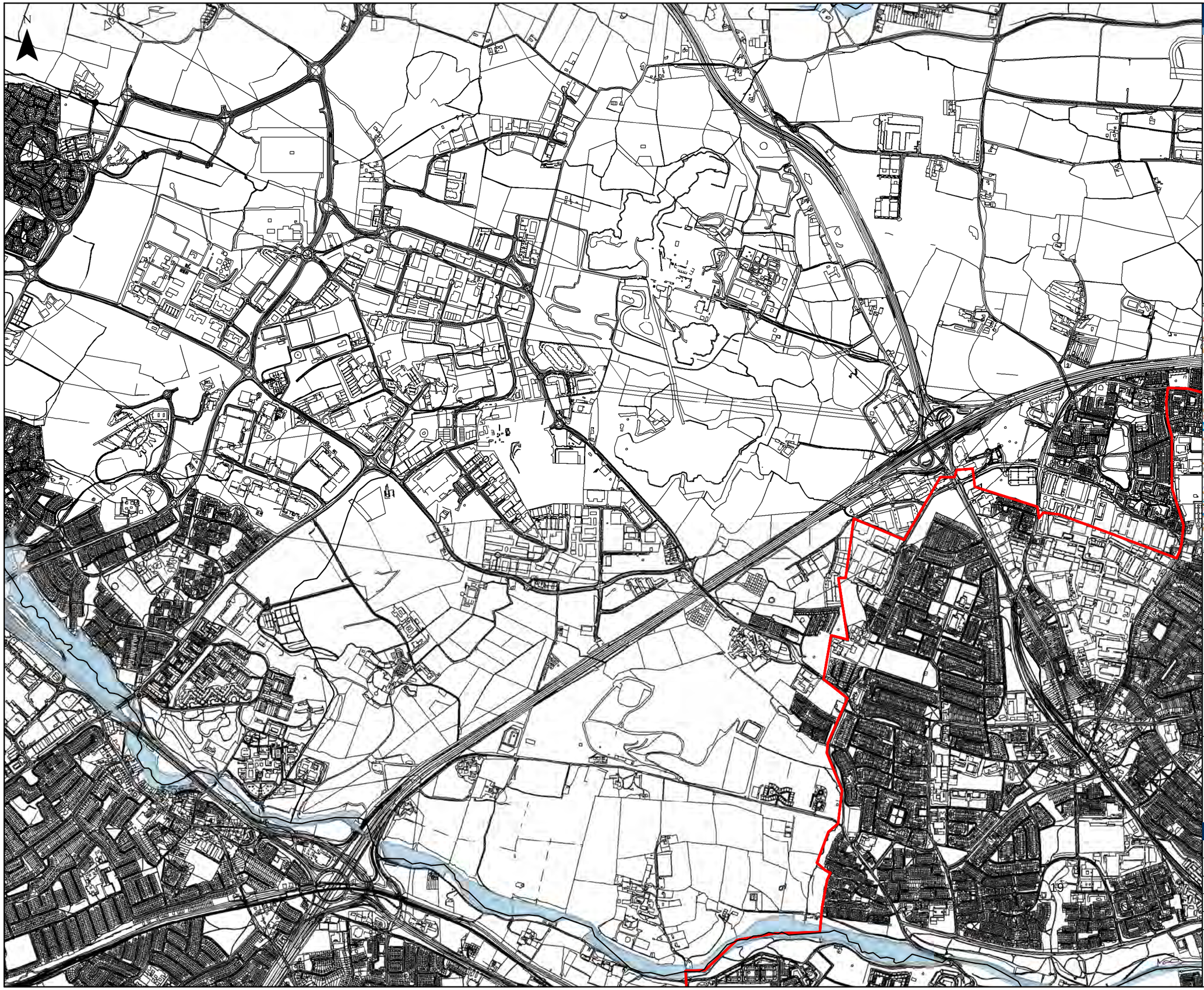
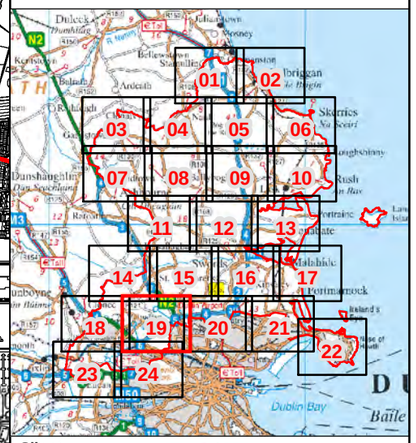


Legend

- Watercourses
- Fingal County Boundary
- Defended Area
- Flood Zone A - 1% AEP (Fluvial) or 0.5% AEP (Coastal) Flood Extent (1 in 100 chance in any given year)
- Flood Zone B - 0.1% AEP Flood Extent (1 in 1000 chance in any given year)
- Indicative Flood Extents



Client

Comhairle Contae Fhine Gall
Fingal County Council

Project

Strategic Flood Risk Assessment

Title

Flood Zone Mapping

Figure Map 19 of 24

RPS

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Scale:	1: 20,000 @ A3	**Drawing No.**	**Rev:**
Date:	08/03/2017	Arc0001	A01

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Appendix B

OPW Historic Flood Maps

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OPW *National Flood Hazard Mapping*

Summary Local Area Report

This Flood Report summarises all flood events within 2.5 kilometres of the map centre.

The map centre is in:

County: Dublin

NGR: O 087 381

Map Scale 1:11,046

Map Legend	
	Flood Points
	Multiple / Recurring Flood Points
	Areas Flooded
	Hydrometric Stations
	Rivers
	Lakes
	River Catchment Areas
	Land Commission *
	Drainage Districts *
	Benefiting Lands *

* Important: These maps do not indicate flood hazard or flood extent. Thier purpose and scope is explained in the Glossary.

5 Results

1. Tolka November 2002 — Start Date: 13/Nov/2002
County: Meath, Dublin — Flood Quality Code: 1
Additional Information: Photos (126) Reports (9) Videos (3) Press Archive (13) More Mapped Information

2. Liffey Lower - Dec 1954 — Start Date: 08/Dec/1954
County: Kildare, Dublin — Flood Quality Code: 2
Additional Information: Reports (4) Press Archive (2) More Mapped Information

3. Tolka Navan Road Adj to Tolka Valley Park Nov 2002 — Start Date: 13/Nov/2002
County: Dublin — Flood Quality Code: 3
Additional Information: Photos (1) Reports (2) Videos (1) Press Archive (3) More Mapped Information

4. M50 at the N3 Interchange Nov 2002 — Start Date: 13/Nov/2002
County: Dublin — Flood Quality Code: 3
Additional Information: Reports (1) More Mapped Information

5. Tolka Herbert Road Blanchardstown Undated — Start Date:
County: Dublin — Flood Quality Code: 4

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Appendix C

GSI Hydrogeology & Geological Maps

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Geological Survey
Suirbhéireacht Gheolaíochta
Ireland | Éireann

B094 - Geology

Scale: 1:10,000
Geological Survey Ireland

0 0.05 0.1 0.2 mi
0 0.1 0.2 0.4 km

Map Centre Coordinates (ITM) 708,628 738,134
10/24/2018, 12:51:00 PM

PSI Licence

Legend

Bedrock Structural Symbols 1:100k

- 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

Bedrock Stratigraphic and Structural lines 1:100k

- 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

- Bedrock Outcrop

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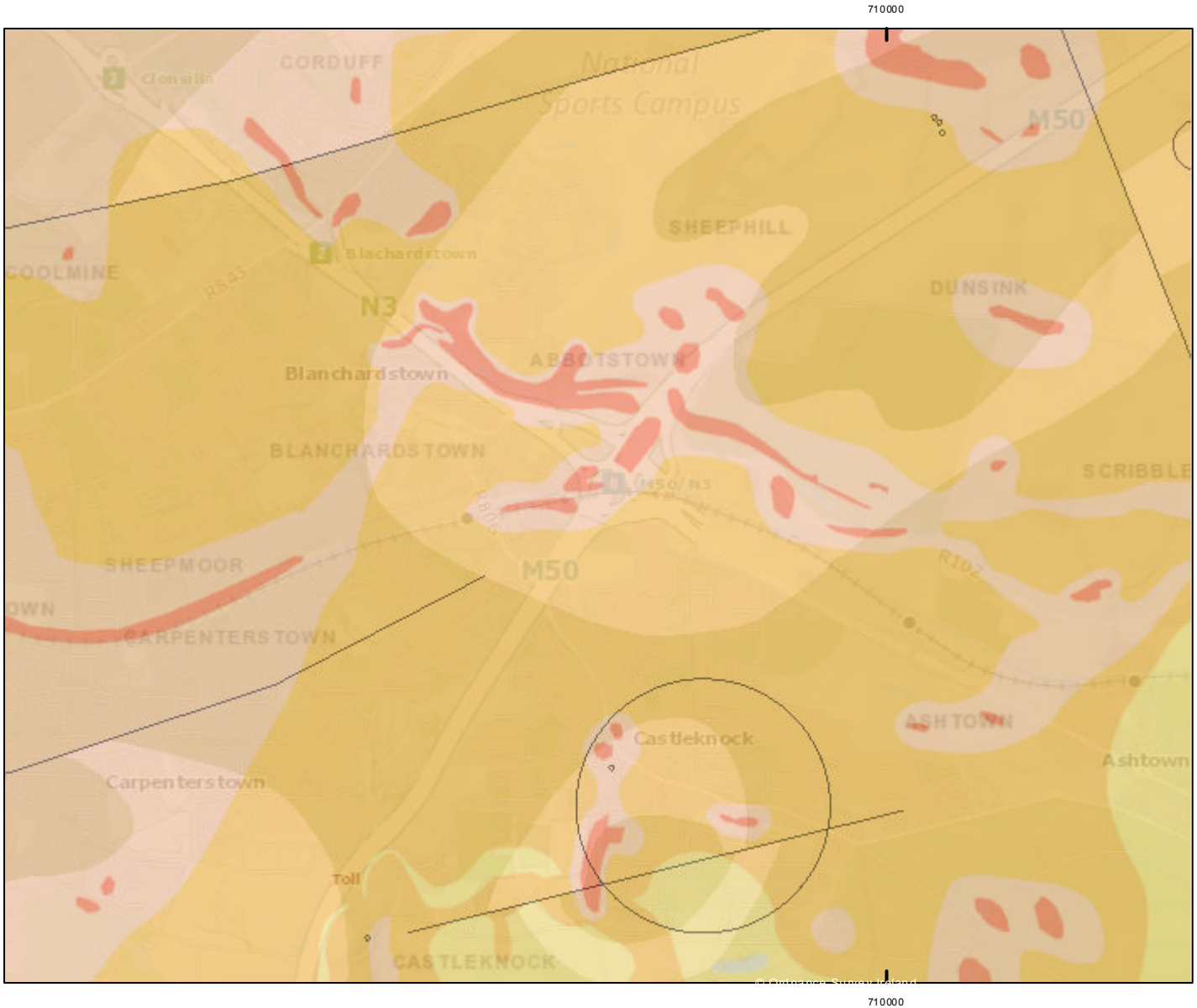
Geological Survey
Suirbhéireacht Gheolaíochta
Ireland | Éireann

B094 - Groundwater



Scale: 1:25,000
Geological Survey Ireland
PSI Licence

0 0.175 0.35 0.7 mi
0 0.275 0.55 1.1 km

Map Centre Coordinates (ITM) 708,865 738,105
10/24/2018, 12:54:40 PM

Legend

- Groundwater Wells and Springs
- Bedrock Aquifer Faults

Gravel Aquifer

- Locally Important Gravel Aquifer
- Regionally Important Gravel Aquifer

Bedrock Aquifer

- Rkc - Regionally Important Aquifer - Karstified (conduit)
- Rkd - Regionally Important Aquifer - Karstified (diffuse)
- RK - Regionally Important Aquifer - Karstified
- Rf - Regionally Important Aquifer - Fissured bedrock
- Lm - Locally Important Aquifer - Bedrock which is Generally Moderately Productive
- Lk - Locally Important Aquifer - Karstified
- Ll - Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones
- Pl - Poor Aquifer - Bedrock which is Generally Unproductive except for Local Zones
- Pu - Poor Aquifer - Bedrock which is Generally Unproductive
- Lake

Groundwater Vulnerability

- X - Rock at or near surface or Karst
- E - Extreme
- H - High
- M - Moderate
- L - Low
- W - Water