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SITE SPECIFIC FLOOD RISK ASSESSMENT

HOUSING DEVELOPMENT AT
STOCKING LANE
BALLYBODEN
DUBLIN 16

Reference: 50-09
Date: 23 September 2021

ENGINEERS IRELAND

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Details

Client:	McCabe Durney Barnes
Architect:	Matt Barnes
Report prepared by:	Ciaran O'Brien

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1 EXECUTIVE SUMMARY

OBA Consulting were appointed by Matt Barnes Architect to provide a flood Risk assessment and report for the proposed new Housing Development at Stocking Lane, Ballyboden, Dublin 16.

The development entails the construction of 131 new dwelling units, comprising 21 houses and 110 apartments, one crèche and one small retail unit on a green field site.

Consultation was undertaken with the South Dublin Assistant Engineer, Environment, Water and Climate Change, Ronan Toft. All surface water queries have been addressed in consecutive emails and associated drawings, dated 22/07/2020 to 27/08/2020. Further details of the consultation are contained within the accompanying OBA Engineering Drainage Report.

Based on the findings below it is our opinion the development poses a negligible flood risk.

2 INTRODUCTION

2.1 PROPOSED DEVELOPMENT

The proposed development will comprise of:

1. 131 new dwelling units, comprising 21 houses and 110 apartments;
2. one crèche; and
3. one retail unit; including
4. local access roads, parking (including basement parking);
5. landscaped public open spaces;
6. public amenity facilities; and
7. associated services

(Refer to Fig 2.1).

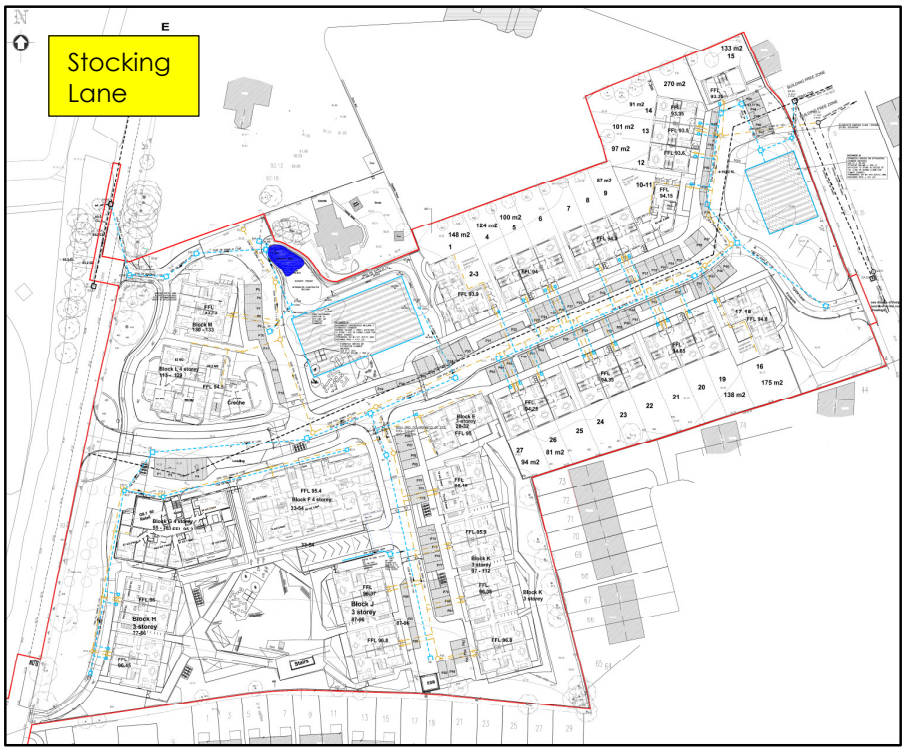


Fig 2.1 Proposed Development (showing proposed drainage)

2.2 FLOOD RISK ASSESSMENT METHODOLOGY

OBA Consulting Engineers were appointed to provide a site-specific flood risk assessment (FRA) in support of the proposed afore-mentioned development.

This FRA is set out in line with the recommendations contained in the Department of Environment Heritage and Local Government and the Office of Public Works (DEHLG/OPW) Guidelines on The Planning System and Flood Risk Management published November 2009, including identification of risk sources, Pathways, Receptors and Mitigating measures. The basis of this FRA will be site specific.

2.3 SITE LOCATION

The proposed housing estate, referred to as the site, is located on the southern edge of Dublin in the townland of Ballyboden between Stocking Lane R115(and the Ballyboden Waterworks) to the west, Springvale Housing Estate to the east, Prospect housing Estate (and the M50 motorway) to the south and several detached houses to the north. Irish Grid reference 313397 X; 226559 Y.

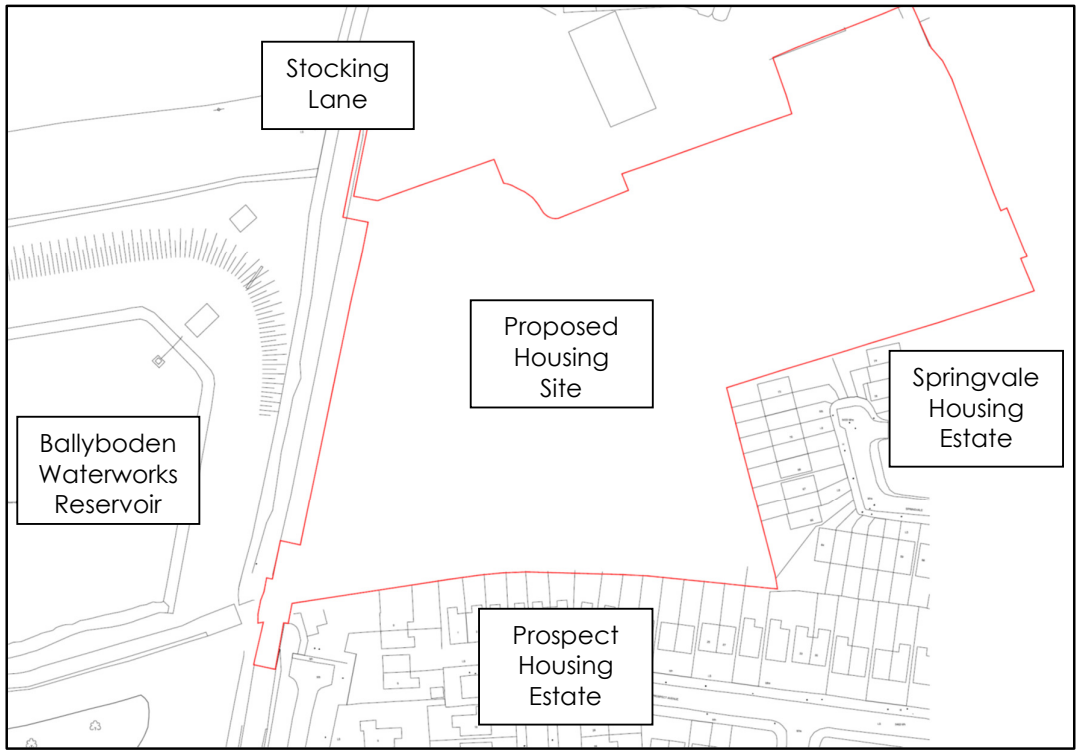


Fig 2.2 Site Location Ordinance Survey Place Map

2.4 EXISTING SITE USAGE & TOPOGRAPHY

The site comprises of an area of approx. 2.4 ha. Designated as Residential.

The site is essentially a green field site with mature trees around the boundaries. Its located on a sloping site (slopes in a northwest – northeast direction) ranging from approximately 98mOD to 93mOD.

An existing 600mm diameter reservoir overflow pipe traverses the site, dividing the site in two, gravitating toward the Springvale Housing Estate and on to the Owendoher River in the East.

2.5 EXISTING WATER COURSES IN THE VICINITY OF THE PROPOSED DEVELOPMENT

The site is situated in a suburban environment with the Owendoher east of the site along Edmondstown Road at the rear of Springvale. There are no natural waterbodies within or bordering the site. The Ballyboden Reservoir is located c. 50m west of the site.

As shown in Figure 2-3 the nearest watercourse to the site is the Owendoher River which is located c. 100m to the east of the subject site.

Fig 2.3 Aerial Photograph

2.6 SITE GEOLOGY

The Geological Survey of Ireland (GSI) groundwater and geological maps of the site were reviewed. The subsoil within the site and surrounding area consists of 'Till made derived from Limestone'. environment.

The underlying bedrock is classified as 'Butter Mountain Formation'. This consists of dark slate-schist, quartzite and coticule. The formation itself comprises dark-grey to black, fine-grained, occasionally cherty, micritic limestones that weather paler, usually to pale grey. Coticule can be traced from the Maulin Formation through schist septa within the Leinster Granite into the Butter Mountain Formation, outcropping as far west as Carig mountain. The associated groundwater vulnerability, which indicates the risk to the underlying groundwater body for the site is classified as 'Low'. The site is situated in a semi urban environment with no natural waterbodies within or bordering the site.

3 FLOOD RISK IDENTIFICATION

Historical and predictive information to allow an evaluation of the potential for flooding of the site and proposed building works is available from various sources including state and semi state bodies, recorded planning documentation and local information.

3.1 Assessment of Flood maps/Flooding History

3.1.1 Floodmaps.ie Website

The Office of Public Works as part of their remit have developed a national flooding hazard map which collects recorded data and flooding events across the country.

We have reviewed the Flooding.ie web site. There has been one recorded flooding event near the site as can be seen on the attached map extract (figure 3.1).

Flooding of the Owendoher River occurred south of the site on Edmondstown Road in November 2000. Three private residences where affected and this flood was possibly linked to works on the M50 motorway. It should be noted that this location is some 10m below the lowest point on the site and as such is not considered to have any significance with respect to potential flooding of the site.

Fig 3.1 Extract from OPW website showing no previous flooding events in the vicinity of the site

3.2 Predictive Flooding Information

The Eastern CFRAM study is the most detailed mapping undertaken in the Dublin region. It commenced in June 2011 with final flood maps issued during 2016. The Eastern CFRAM involves detailed hydraulic modelling of rivers and their tributaries. Following the detailed hydraulic modelling, flood maps were produced for the 10%, 1% and 0.1% AEP flood events.
The available CFRAM maps cover the proposed site area. CFRAM maps covering the area of the Owendoher River to the east (part of the Dodder Catchment), indicate Fluvial flooding extents are limited to the mapped areas south of the site at levels some 10m (82.25mOD for the 1000-year event). (Refer to Appendix A and Fig 3.3). The site is well elevated above potential Coastal flooding.

In the context of this site there is no flooding predicted for either a 100-year or 1000-year event for both Coastal and Fluvial flooding.

3.3 Sources of Flooding

The initial stage of a Flood Risk Assessment requires the identification and consideration of probable sources of flooding. Following the initial phase of this Flood Risk Assessment, it is possible to summarise the level of potential risk posed by each source of flooding. The flood sources are described below.

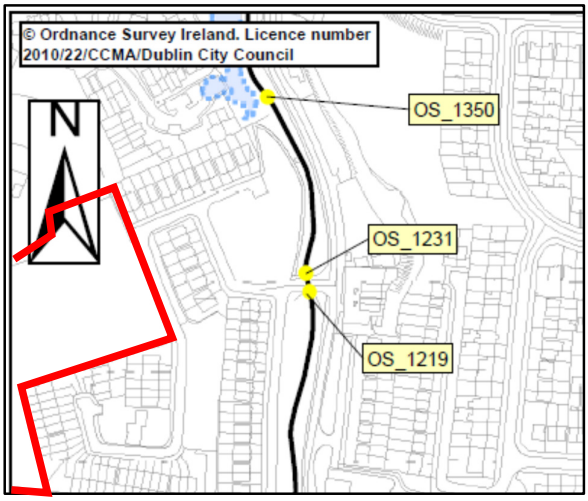
3.3.1 COASTAL

Review of the Eastern CFRAM flood maps confirms that the site is well elevated above potential Coastal flooding, this risk can be screened out of this report.

3.3.2 FLUVIAL

All available sources of historic flooding have been researched as part of the FRA. The nearest watercourse to the site is the Owendoher River c. 100m to the east. Review of the fluvial flood mapping produced as part of the CFRAM study confirms that the site is located in Flood Zone C. Based on the available information. (Refer to Fig. 3.3).

The site lowest FFL is located at an elevation of 93.35mOD Malin, and since the nearest 0.1% AEP Fluvial flood level is at 82.25m OD, this risk can be screened out of this report.



	Water Level (mOD) per AEP		
Node Label	WL 10%	WL 1%	WL 0.1%
OS_1350	81.68	81.94	82.25

Fig 3.3 CFRAM interactive mapping showing extents of Fluvial flooding

3.3.3 PLUVIAL

Pluvial or surface water flooding is the result of rainfall-generated flows that arise before run-off can enter a watercourse or sewer. A number of sources have been researched as part of the OPW PFRA flood mapping and review of floodmap.ie. based on review of the available information there is no recorded or predicted pluvial flooding at the site. It should be noted that due to the lack of existing sewers and the sloping topography, pluvial flooding can be ruled out as no standing water or induced sewer exceedance flooding can occur.

The provision of completely separated foul and SW systems as proposed is to be ensured, both in installation and use. All new precast SW manholes are to have a minimum thickness surround of 150mm concrete class B. All works for this development are to comply with the Dublin Regional Code of Practice for Drainage Works.

3.3.4 GROUND WATER.

The OPW PFRA was reviewed and did not indicate groundwater flooding at the site or surrounding area. The GSI groundwater vulnerability for the site is classified as 'low'. Furthermore, there are no karst features in the area which would indicate areas at risk of groundwater flooding. In summary, there is no known risk of groundwater flooding in this area and has been screened out at this stage.

4 FLOOD RISK IMPACT ASSESSMENT, RECEPTORS & MITIGATION.

Review of the available sources of flooding outlined above confirms that there are no identified historic flooding events within or in close proximity to the site.

The site is located within Flood Zone C.

4.1 FLOOD RISK & MITIGATING MEASURES.

A.

Source	Surcharge backup from public sewers.
Receptor	Housing Estate
Likelihood	Low.
Mitigation	Design and proposed construction is in accordance with regulation and guidelines, proposed regular maintenance to ensure proper operation of systems.

4.2 IMPACT ON ADJOINING PROPERTIES.

The site is outside the predicted flooding areas based on the CFRAM maps. There can therefore be no displacement effect.

The site topography provides the potential for runoff entering properties on the downhill (northern) side of the site. This is mitigated through the provision of a new SW sewer system, property terracing and the introduction of property boundary walls.

5 CONCLUSION

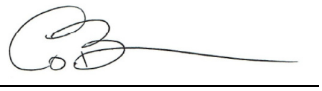
- No OPW record of flooding with the potential to affect the proposed development on the site or in the immediate vicinity of the site;
- The site is beyond the reach of coastal flooding effects;
- The proposed development is located outside (and above) the identified CFRAM Fluvial flooding zone;
- The nature of the topography prevents standing water ponding;
- Stocking Lane and the site has moderate fall (watershed) northwards;
- Mitigation measures including the provision of a new SW sewers system, terracing of private gardens and the provision of property boundary walls will reduce effects on the adjoining neighbouring sites;
- Proposed SUDS include attenuation, which will reduce SW discharge rate to the existing SW sewer system.
- The provision of completely separated foul and SW systems as proposed is to be ensured, both in installation and use. All new precast SW manholes are to have a minimum thickness surround of 150mm concrete class B. All works for this development are to comply with the Dublin Regional Code of Practice for Drainage Works.

Given the findings above it is our opinion that the site and development pose negligible flood risk.

The assessment is a desk top study based on the best available data, this report provides, in our view, the best available assessment of the effect of flooding at the site. In using the DEHLG/OPW Guidelines it is determined that the development site is located within Flood Zone C.

References

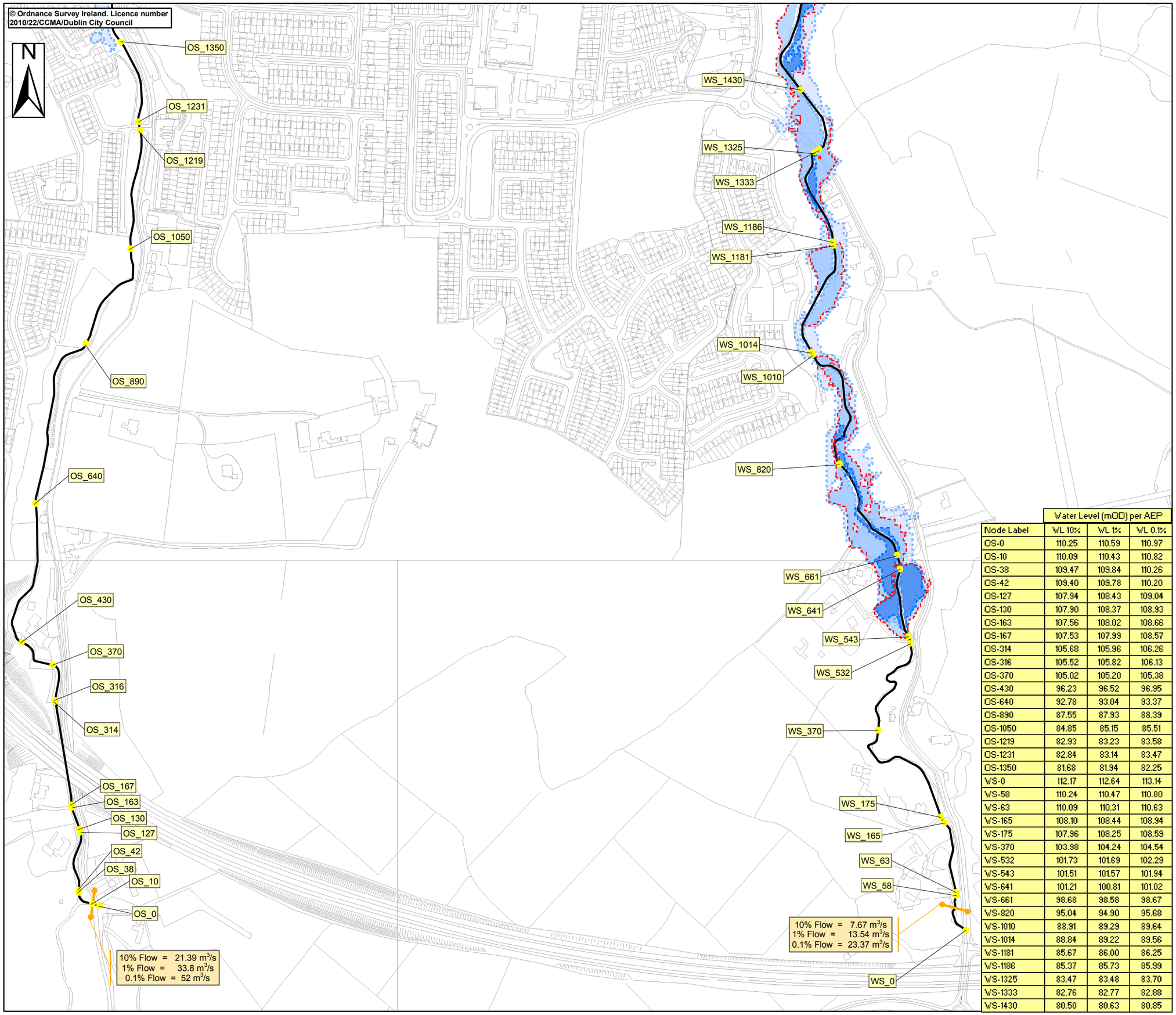
1. National Flood Hazard Mapping, www.floodmaps.ie, OPW.
2. Eastern CFRAM Study, Flood Maps, www.floodinfo.ie/map/floodmaps/ OPW.
3. Dublin City Development Plan 2016-2022, Volume 7, Strategic Flood Risk Assessment (SFRA)
4. Greater Dublin Strategic Drainage Strategy; and
5. Greater Dublin Regional Code of Practice for Drainage Works.



Ciaran O'Brien

BEng, CEng, MIEI, EurIng, FConsEI

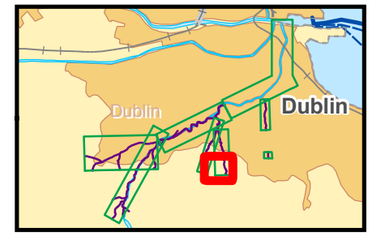
6 APPENDIX A OPW FLUVIAL CFRAM STUDY MAPS



Water Level (mOD) per AEP

Node Label	WL 10%	WL 1%	WL 0.1%
OS-0	110.25	110.59	110.97
OS-10	110.09	110.43	110.82
OS-38	109.47	109.84	110.26
OS-42	109.40	109.78	110.20
OS-127	107.94	108.43	109.04
OS-130	107.90	108.37	108.93
OS-163	107.56	108.02	108.66
OS-167	107.53	107.99	108.57
OS-314	105.68	105.96	106.26
OS-316	105.52	105.82	106.13
OS-370	105.02	105.20	105.38
OS-430	96.23	96.52	96.95
OS-640	92.78	93.04	93.37
OS-890	87.55	87.93	88.39
OS-1050	84.85	85.15	85.51
OS-1219	82.93	83.23	83.58
OS-1231	82.84	83.14	83.47
OS-1350	81.68	81.94	82.25
WS-0	112.17	112.64	113.14
WS-58	110.24	110.47	110.80
WS-63	110.09	110.31	110.63
WS-165	108.10	108.44	108.94
WS-175	107.96	108.25	108.59
WS-370	103.98	104.24	104.54
WS-532	101.73	101.69	102.29
WS-543	101.51	101.57	101.94
WS-641	101.21	100.81	101.02
WS-661	98.68	98.58	98.67
WS-820	95.04	94.90	95.68
WS-1010	88.91	89.29	89.64
WS-1014	88.84	89.22	89.56
WS-1181	85.67	86.00	86.25
WS-1186	85.37	85.73	85.99
WS-1325	83.47	83.48	83.70
WS-1333	82.76	82.77	82.88
WS-1430	80.50	80.63	80.85

Location Plan:



Legend:

- 10 % AEP Flood Extent (1 in 10 chance in any given year)
- 1 % AEP Flood Extent (1 in 100 chance in any given year)
- 0.1 % AEP Flood Extent (1 in 1000 chance in any given year)
- Defended Area
- High Confidence (<20m) (10% AEP)
- Medium Confidence (<40m) (10% AEP)
- Low Confidence (>40m) (10% and 0.1% AEP)
- High Confidence (<20m) (1% AEP)
- Medium Confidence (<40m) (1% AEP)
- Low Confidence (>40m) (1% AEP)
- River Centreline
- Node Point
- OS_2975 — Node Label (refer to table)
- Flow reporting location
- 10% Flow = 1.20 / 1% Flow = 1.56 / 0.1% Flow = 2.17 — Peak flow during design flood extent

USER NOTE:

USERS OF THESE MAPS SHOULD REFER TO THE DETAILED DESCRIPTION OF THEIR DERIVATION, LIMITATIONS IN ACCURACY AND GUIDANCE AND CONDITIONS OF USE PROVIDED AT THE FRONT OF THIS BOUND VOLUME. IF THIS MAP DOES NOT FORM PART OF BOUND VOLUME, IT SHOULD NOT BE USED FOR ANY PURPOSE.

Client:

Dublin City Baile Átha Cliath · South Dublin County Council · Dún Laoghaire-Rathdown County Council Comhairle Contae Dhún Laoghaire-Ráth an Dúin · OPW

Project:

DODDER CATCHMENT FLOOD RISK ASSESSMENT AND MANAGEMENT STUDY

Map:

PRESENT DAY OWENDOHER & WHITECHURCH

Map Type: FLOOD EXTENT

Source: FLUVIAL FLOODING

Map Area: URBAN AREA

Scenario: CURRENT

Drawn By : A.A.B **Date :** 26 November 2010

Checked By : A.J. **Date :** 26 November 2010

Approved By : A.G.B **Date :** 26 November 2010

Figure No. :

OSWS/EXT/UA/CURS/103

Map Series : Page 1 of 3

Drawing Scale : 1: 5,000 **Plot Scale : 1:1 @ A3**

0 0.1 0.2 Kilometers

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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 133 265

Map Scale 1:7,396

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.

19 Results

1. Owendoher River 24th Oct 2011 Willbrook Road — Start Date: 24/Oct/2011
County: Dublin — Flood Quality Code:2
Additional Information: Reports (1) More Mapped Information

2. Little Dargle Grange Road Nov 1982 — Start Date: 07/Nov/1982
County: Dublin — Flood Quality Code:3
Additional Information: Reports (1) More Mapped Information

3. Dodder Mount Carmel Park recurring — Start Date:
County: Dublin — Flood Quality Code:4
Additional Information: Reports (1) Press Archive (1) More Mapped Information

4. Flooding at Homeville, Knocklyon, Dublin 16.on 24th Oct 2011 — Start Date: 24/Oct/2011
County: Dublin — Flood Quality Code:2
Additional Information: Reports (1) More Mapped Information

5. Flooding at Castlefield, Glenvara and Glenlyon, Knocklyon, Dublin 16.on 24th Oct 2011 — Start Date: 24/Oct/2011
County: Dublin — Flood Quality Code:2

Additional Information: Reports (1) More Mapped Information

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6. Flooding at Nutgrove Avenue, Rathfarnham, Dublin 14on 24th Oct 2011
County: Dublin
Start Date: 24/Oct/2011
Flood Quality Code:2

Additional Information: Reports (1) More Mapped Information

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7. Grange River Kilmashogue Lane June 2003
County: Dublin
Start Date: 30/Jun/2003
Flood Quality Code:4

Additional Information: Reports (2) More Mapped Information

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8. Mount Carmel Park Firhouse Nov 2000
County: Dublin
Start Date: 05/Nov/2000
Flood Quality Code:3

Additional Information: Reports (1) Press Archive (1) More Mapped Information

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9. Knocklyon Ave Nov 2000
County: Dublin
Start Date: 05/Nov/2000
Flood Quality Code:3

Additional Information: Reports (1) More Mapped Information

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10. Owenadoher Edmondstown Road. Nov 2000
County: Dublin
Start Date: 05/Nov/2000
Flood Quality Code:3

Additional Information: Reports (2) More Mapped Information

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11. Old City water Course Spawell House Feb 1994
County: Dublin
Start Date: 03/Feb/1994
Flood Quality Code:3

Additional Information: Reports (1) More Mapped Information

---

12. Barton Drive Ballyboden Feb 1994
County: Dublin
Start Date: 03/Feb/1994
Flood Quality Code:3

Additional Information: Reports (1) More Mapped Information

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13. Boden Villas Feb 1994
County: Dublin
Start Date: 03/Feb/1994
Flood Quality Code:3

Additional Information: Reports (1) More Mapped Information

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14. Whitechurch Court Feb 1994
County: Dublin
Start Date: 03/Feb/1994
Flood Quality Code:3

Additional Information: Reports (1) More Mapped Information

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15. Owendoher Willbrook Road August 1986
County: Dublin
Start Date: 25/Aug/1986
Flood Quality Code:3

Additional Information: Reports (2) Press Archive (1) More Mapped Information

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16. Willbrook Rathfarnham Dec 1958
County: Dublin
Start Date: 16/Dec/1958
Flood Quality Code:4

Additional Information: Reports (1) More Mapped Information

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17. Ballyboden Road Whitecliff Recurring
County: Dublin
Start Date:
Flood Quality Code:3

Additional Information: Reports (1) More Mapped Information

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18. Manor Rise Recurring
County: Dublin
Start Date:
Flood Quality Code:4

Additional Information: Reports (2) More Mapped Information

19. Grange Stream Tibradden Lane Mutton Lane Recurring

Start Date:

County: Dublin

Flood Quality Code: 4

Additional Information: Reports (2) More Mapped Information