Warehousing/Logistics, Office & Cafe/Restaurant Development at Calmount Road

Site Specific Flood Risk Assessment (SSFRA)

210175-DBFL-XX-XX-RP-C-0002

INFRASTRUCTURE

April 2022

DBFL CONSULTING ENGINEERS

Project Title:	**Warehousing/Logistics, Office & Cafe/Restaurant Development at Calmount Road**		
Document Title:	**Site Specific Flood Risk Assessment (SSFRA)**		
File Ref:	**210175-DBFL-XX-XX-RP-C-0002**		
Status:	**S2 Suitable for Information**	Rev:	**P01**

Rev.	Date	Description	Prepared	Reviewed	Approved
1	08/04/21	Issued for Planning	Rory Moynihan	Paul Forde	Paul Forde

Contents

Figures

Tables

1 INTRODUCTION

1.1 Site information

DBFL Consulting Engineers were commissioned by the Applicant (Blackwin Ltd.) to prepare a Site-Specific Flood Risk Assessment (SSFRA) for the proposed warehousing and logistics development at an infill site located in Calmount Road, southwest Dublin. Industrial and commercial units border the site to the north and west respectively. The site is currently vacant and consists of a grassed area, with an industrial, enterprise and employment development objective. The applicant's site has an area of approximately 7.1ha with a redline boundary extending to 7.45Ha and falls in a north easterly direction at a gradient of 1:40.

1.2 Proposed Development

The proposed development consists of the following:

- Construction of 5 no. warehouse / logistics units (Units 1, 2 3, 4 and 6), including ancillary office use and entrance / reception areas over two levels, with maximum heights of c. 17.09 metres and a combined total gross floor area (GFA) of 20,158 sq.m;
- Each warehouse / logistics unit includes car parking to the front, and service yards, including HGV loading bays, to the rear of each unit. Signage zones are proposed for each unit. A total of 200 no. car parking spaces and 110 no. cycle spaces are provided for the 5 no. warehouse / logistics units;
- Construction of 3 no. 3 storey own-door office buildings (Block 5A, 5B and 5C) with maximum heights of c. 13.45 metres and a combined GFA of 4,194 sq.m. Signage zones are proposed at the entrances to the buildings. A total of 77 no. car parking spaces and 50 no. cycle parking spaces are provided for the proposed office buildings;
- Construction of a café/restaurant unit with a maximum height of c. 6.09m and a GFA of 213 sq.m to be located in the south western section of the site. The proposal includes signage for the unit, associated outdoor seating and a bin store. 14 no. car parking spaces and 10 no. cycle spaces are provided for the café/restaurant unit;
- The proposal includes 5 no. ESB substation buildings;
- The development is to be accessed off Ballymount Avenue and Calmount Road and includes for alterations and upgrades to the public footpaths and road. The development

provides for vehicular and service access points, associated internal access roads, circulation areas and footpaths; and

- The proposal includes landscaping and planting, entrance signage, boundary treatments, lighting, PV panels, green roofs, underground foul and storm water drainage network, including connections to the foul and surface water drainage network on the public roads, attenuation areas and all associated site works and development.

Figure 1-1 Proposed Site Boundary

This SSFRA was prepared to comply with the current planning legislation, the recommendations of "The Planning System & Flood Risk Management – Guidelines for Planning Authorities".

1.3 Objectives

The objective of this report is to inform the planning authority regarding flood risk for the development of logistical and warehousing units on the subject site. The report assesses the site and development proposals in accordance with the requirements of "The Planning System and Flood Risk Management Guidelines for Planning Authorities".

The report clarifies the site's flood zone category and presents information which would facilitate an informed decision of the planning application in the context of flood risk. The report also outlines appropriate flood risk mitigation and management measures for any residual flood risk.

The site is covered by the strategic flood risk assessment undertaken for the South Dublin County Council Development Plan 2016-2022 and the ECFRAM study. The coast is approximately 10km due east.

2 PLANNING SYSTEM & FLOOD RISK MANAGEMENT GUIDLINES

2.1 General

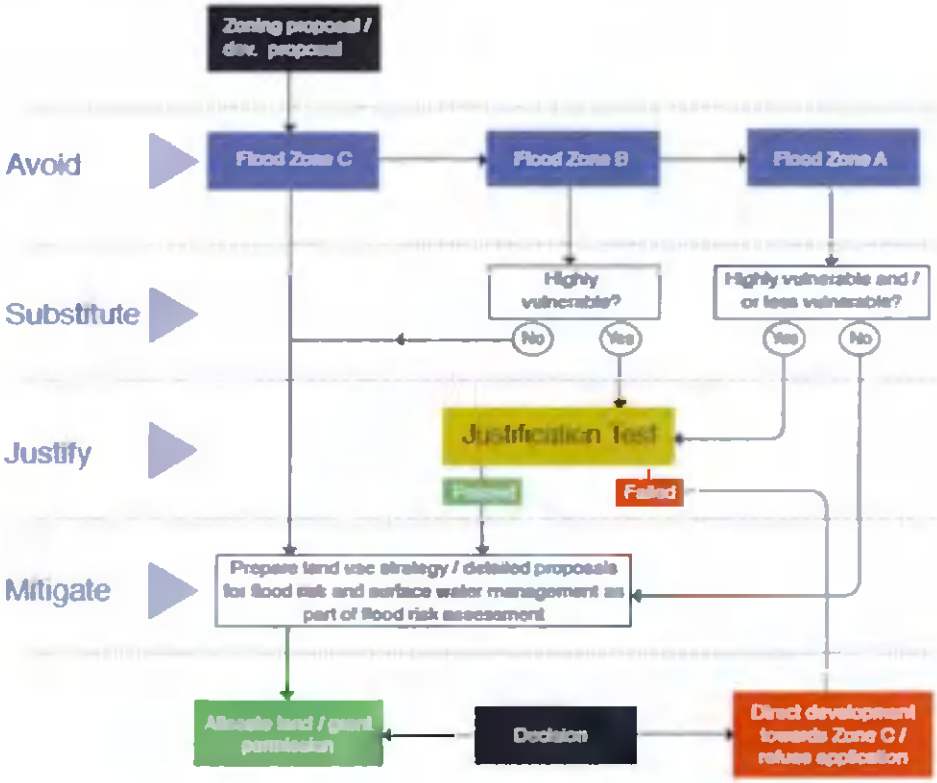
"*The Planning System and Flood Risk Management Guidelines for Planning Authorities*", November 2009 and its technical appendices outline the requirements for a site-specific flood risk assessment.

Buildings used for retail, leisure, warehousing, commercial, industrial and non-residential institutions are classified as "less vulnerable development" according to Table 3.1 of the guidelines. Table 3.2 of the guidelines indicates that this type of development is appropriate and compatible with Flood Zone B and C i.e. outside the 1:100-year (1% AEP) flood extents.

Less vulnerable development may also be compatible with Flood Zone Category A depending on its performance in a site justification test. Therefore, as part of the sequential approach mechanism of the guidelines, a justification test is only required if 'less vulnerable development' is proposed in Flood Zone A.

2.2 Flood Risk Assessment Stages

This site-specific risk assessment will initially use flood risk information to determine the flood zone category of the site and to check if the Guidelines Sequential Approach has been applied or if a justification test is required; - refer to **Figure 2.1** below for details. Flood risk is normally assessed by a flood risk identification stage followed by an initial flood risk assessment. A more detailed flood risk assessment stage may then follow which includes an assessment of surface water management, flood risk and mitigation measures to be applied.



3 FLOOD RISK IDENTIFICATION STAGE

3.1 General

The initial flood risk identification stage uses existing information to identify and confirm whether there may be flooding or surface water management issues for the lands in question that warrant further investigation.

3.2 Information Sources Consulted

Information sources consulted for the identification exercise are outlined in Table 3.1 below.

Information	Source
Predictive and historic flood maps, and benefiting lands maps, such as those available on http://www.floods.ie;	OPW www.floodmaps.ie website consulted.
Predictive fluvial, coastal, pluvial and groundwater flood maps.	ECFRAMS (Refer to **figure 3.1)**
Flood Risk Management Measures	www.floodinfo.ie
Topographical maps, digital elevation models produced by aerial survey or ground survey techniques;	OSI Maps consulted.

Information	Source
Information on flood defence condition and performance;	Floodinfo.ie, site visits.
Information on existing public sewerage condition and performance;	GDSDS performance maps for existing sewerage in the vicinity of the subject site examined.
Alluvial deposit maps of the Geological Survey of Ireland. These maps, while not providing full coverage, can indicate areas that have flooded in the past.	GSI maps consulted.
National, regional & local spatial plans, such as the National Spatial Strategy, regional planning guidelines, development plans & local area plans provide key information on existing and potential future receptors.	SDCC Development Plan 2016-2022 Strategic Flood Risk Assessment consulted.

Table 3-1: Information Sources Consulted

Figure 3-1 Extract from Flood Info Mapping
Showing Subject Site 'x'

3.3 Predictive & Historic Flood Maps

The OPW website, www.floodinfo.ie, indicates a number of flood events within 2.5km of the site however none of these events are considered to be within an influenceable distance of the site – Refer to report generated for the site in Appendix A.

The OPW recently completed the Eastern Catchment Flood Risk and Management Study (ECFRAMS) to fulfil the requirements of the EU Floods Directive (2007/60/EC). The ECFRAM was commissioned in June 2011 with the aim of the study to identify areas at risk from flooding and hence develop flood risk management options for 'at risk' areas. The ECFRAM Programme included three main stages; the Preliminary Flood Risk Assessment (2011), Flood Risk and Hazard Mapping (late 2014) and Flood Risk Management Plans (2016). The Flood Risk Assessment maps do not indicate any flood risk in the site. Refer to Appendix B. The subject site is shown to be outside the

flood extents of the 1% and 0.1% AEP events (1:100, 1:1000 year events) modelled as part of the ECFRAM study and as such is categorised as Flood Zone C.

Information on potential pluvial flooding was taken from The Dublin City Development Plan 2016-2022 – Strategic Flood Risk Assessment Volume 7. This SSFRA presents high level assessment of pluvial flood risk taken from the FloodResilienCity Project – please refer to Appendix C for full map. The model provided by the FloodResilienCity Project indicates that the site is not at risk of widespread hazardous pluvial inundation for the 1% AEP Event – 3Hr duration model.

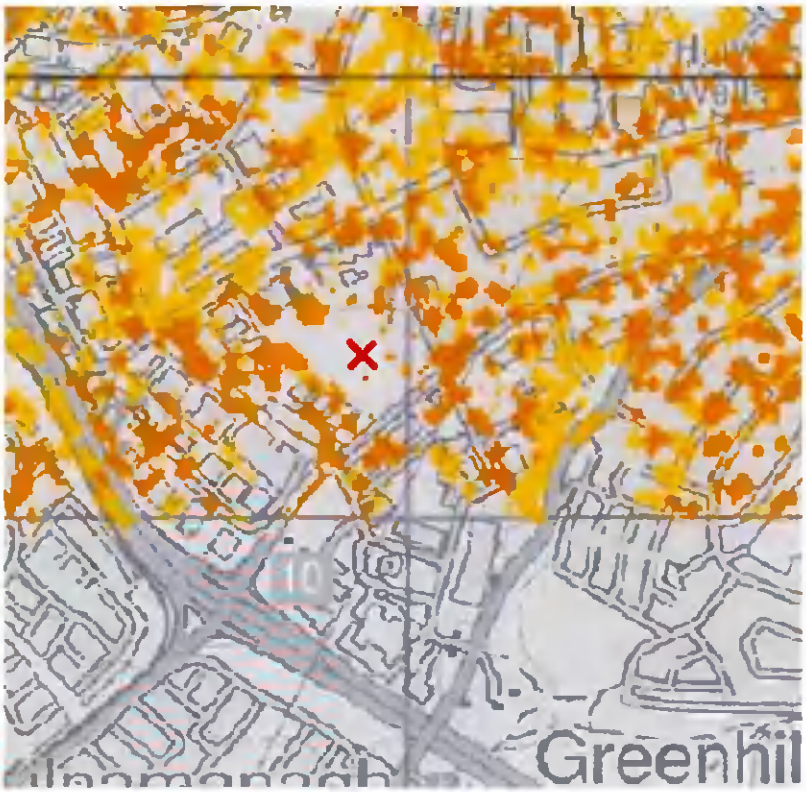


Figure 3-2 Extract from Pluvial FloodResilienCity Project Mapping Showing Subject Site 'x'

3.4 Tidal Flood Maps

The proposed subject site is located approximately 10km west of the coast and therefore is not at risk of tidal flooding.

3.5 Other Sources

Other information sources were consulted to determine if there was any additional flood risk to the site, these included;

- Topographical surveys of the area – no evidence of flood vulnerability based on topography.
- Geological Survey (GSI maps) indicate:
    - The site is formed primarily of dark limestone and shale
    - Subsoil Permeability is Low
    - Groundwater vulnerability is high to extreme.
    - There is a locally important Aquifer, Bedrock which is Moderately Productive only in local zone.
    - No karst features are in this area.
    - Flood defence information – there are no flood defences in the vicinity of the site.
- Ground Investigation data – A preliminary site investigation has been carried out for the site. The majority of the trial pits undertaken showed no signs of groundwater. A review of the findings indicates that there is low to no risk of groundwater flooding at the site.
- Existing Local Authority Drainage Records: There are no existing services traversing the site as indicated by the existing drainage records.
- From a review of the 'other sources' outlined above the only potential flood risks to the development would be to the lower levels of the proposed development from pluvial sources and a very low risk to proposed drainage infrastructure from groundwater

3.6 Source-Pathway-Receptor Model

A Source-Pathway-Receptor model was produced to summarize the possible sources of floodwater, the people and assets (receptors) that could be affected by potential flooding (with specific reference to the proposals) and the pathways by which flood water from an event exceeding 1%AEP (Annual Exceedance Probability) would follow - see **Table 3.2** below. It provides the probability and magnitude of the sources, the performance and response of pathways, and the consequences to the receptors in the context of the proposed warehousing/logistics, office and café/restaurant development. These sources, pathways and receptors will be assessed further in the initial flood risk assessment stage.

It is clear from the flooding analysis in **Table 3.2** that the proposed site is not at risk from tidal or fluvial flooding due to its geographic location and topography.

There is, however, a moderate risk of pluvial and groundwater flooding of the drainage infrastructure and basements, and moderate risk of flooding of the site due to the potential surcharging and blockage of the new drainage network.

Consequently, an initial flood risk assessment will follow to provide further detail on the causes, effects and possible mitigation measures for the types of flooding identified above.

Source	Pathway	Receptor	Likelihood	Impact	Risk
Tidal	Tidal flooding from coast 10km away.	**Residents (people)** development, **visitors** and the **buildings** themselves and other **property** such as **vehicles** located in car park areas.	Remote	High	Very Low
Fluvial	Flooding from River nearby rivers or fluvially linked drainage (none within influenceable distance of the site)	**Residents (people)** development, **visitors,** and the **buildings** themselves and other **property** such as **vehicles** located in car park areas.	Remote	High	Very Low
Surface Water - Pluvial	Flooding from surcharging of the development's drainage systems	**Residents (people)** development, **visitors** and the **buildings** themselves and other **property** such as **vehicles** located in car park areas.	Possible	High	Moderate
Surface Water - Pluvial	Flooding from internal sources – overland flows	**Residents (people)** development, **visitors** and the **buildings** themselves and other **property** such as	Possible	High	Moderate

Source	Pathway	Receptor	Likelihood	Impact	Risk
		vehicles located in car park areas.			
Surface Water - Pluvial	Flooding from external sources – overland flows	**Residents (people)** development, **visitors** and the **buildings** themselves and other **property** such as **vehicles** located in car park areas.	Possible	High	Moderate
Groundwater flooding	Rising GWL on the site	**Residents (people)** development, **drainage infrastructure, visitors** and the **buildings** themselves and other **property** such as **vehicles** located in basement car park areas.	Possible	High	Moderate
Human or Mechanical Error (Pluvial)	Petrol interceptor and hydro brakes	Areas of development draining to the surface water network; **Residents (people)** development, **visitors** and the **buildings** themselves and other **property** such as **vehicles** located in car park areas.	Possible	High	Moderate

Table 3-2: Source-Pathway-Receptor Model

4 INITIAL PLUVIAL FLOOD RISK ASSESSMENT

The Source-Pathway-Receptor model identified that there could be potential for pluvial flood risk within the development site related to the drainage system that could potentially cause local flooding unless it is designed in accordance with the regulations e.g. Greater Dublin Strategic Drainage Study (GDSDS) and to take account of flood exceedance for storms return periods exceeding 1% AEP (Annual Exceedance Probability).

Proper operation and maintenance of the drainage system should also be implemented to reduce the risk of human or mechanical error causing pluvial flood risk from blockages etc.

4.1 Flood Zone Category

Following the assessment of the flood risks to the site and the available information it is considered that the proposed site is located within Flood Zone Category C as defined by the Guidelines and as indicated by the ECFRAMS maps – refer to Appendix B. Therefore, the proposed development on the subject site is appropriate for this flood zone category, and a justification test is not required.

5 DETAILED FLOOD RISK ASSESSMENT STAGE

5.1 General

As a justification test is not required, a detailed flood risk assessment must be carried out which considers moderate pluvial flood risk in relation to the following;

- Proposed Surface Water Management measures.
- Flood Exceedance.
- Impact of proposals on flood risk to adjacent areas.
- Effects of climate change.
- Access and Egress during Flood Events
- Residual risks.
- Effectiveness of any flood mitigation measures.

5.2 Proposed Surface Water Management Measures

The following approach and parameters have been used: -

- Drainage design consists of Sustainable Drainage system (SuDS) with roof downpipes, gullies, pipes, manholes, attenuation systems and discharge control at outlets;
- SuDS systems to be provided including green roofs, attenuation systems and swales;
- Attenuation to an underground attenuation system;
- Climate change factor of 20% has been applied;
- Site discharge rate is controlled to SDCC requirements of 2l/s/Ha;
- Overland flow routes have been designed to direct surface flows away from buildings.

5.3 Assessment of Flood Risk

5.3.1 Flood Exceedance – Pluvial

Flooding from overland flows: -

Elevations levels on site will be designed such that overland flow caused by flooding from the site drainage system, or from surface water that fails to enter the site drainage system in extreme events, will not flood buildings, ramps or footpaths.

Pluvial Flood Risks: -

Flooding from surcharging of the development's drainage systems: -

The surface water pipe system has been designed using MICRODRAINAGE Simulation modelling. MICRODRAINAGE Simulation uses the Wallingford Procedure, time/area full hydrograph methodology, including energy and momentum equations for dynamic analysis of surface water networks. The site drainage network has been modelled as one system where all flows, capacities, water levels, surcharged manholes etc are determined throughout the network for each critical storm duration.

The surface water drainage system has been designed to ensure that no flooding occurs throughout the site for the design return period of 1 in 100 years, the pipe system will then be considered to exceed the requirements of the GDSDS for a 1 in 30-year return period surcharge check.

The attenuation systems have been sized for a 1 in 100-year return period, which exceeds the requirements of the GDSDS, and it is designed using the current rainfall depth values available from Met Eireann including 20% increase for the effects of climate change.

In order to assess the likelihood of pluvial flooding occurring, a surface water drainage simulation model was carried out using MICRODRAINAGE for the entire site. This model highlighted any individual manholes at risk of flooding in a 1 in 100-year storm event. With the proposed network modelled for a 1:100-year event. The limit for Flood Risk identification is a modelled top water level within 300mm of the proposed cover level. The proposed network did not produce any manhole identified as being at 'Flood risk' surcharging levels.

Despite flood risk not being highlighted on the MICRODRAINAGE model several mitigation measures have been implemented as good practice. These mitigation measures will consist of designing overland flows to direct any floodwater away from buildings, either keeping it within the carriageway or directing the surface water to designated green areas within the site. The finished floor levels for all buildings in the vicinity will be designed to be above the surcharged level for any manhole in danger of flooding. Furthermore, finished floor levels for all buildings will be a minimum of 500mm above the maximum flood levels in nearby surface water attenuation systems.

5.3.2 Flood Exceedance – Groundwater

A detailed hydrogeological report will be undertaken as part of the next design phase to determine if the site foundations and the surface water attenuation system may be at risk of rising

groundwater levels where water could enter structural excavation or the attenuation tank and could exert hydrostatic uplift pressures. Foundations and structural elements will be designed to resist hydrostatic uplift.

The attenuation system will be designed such that no flotation of the system will occur. A permeable vertical gravel/stone layer will be installed around the tank to minimise any 'back-up' of groundwater levels up-gradient of the tank, thereby preventing ponding or flooding at the site.

5.3.3 Human or Mechanical Error – Pluvial

If hydrobrakes and silt traps manholes are not adequately cleaned and maintained, there is a risk that they would become a throttle and cause flooding upstream. Silt trap manholes have been proposed upstream of the proposed attenuation system to prevent ingress of suspended solids to the attenuation. These will be maintained as part of Mitigation Measure M1

5.3.4 Effects of Climate Change

The effects of climate change have been addressed when modelling the proposed surface water sewer network. Each of the rainfall simulations for the proposed network have been modelled with a 20% allowance for climate change as per agreements with SDCC. Consequently the proposed network and attenuation system has been sized to cater for the increased rainfall associated with climate change.

5.3.5 Access and Egress During Flood Events

During flood events, access and egress would need to be maintained and overland flow routes and extents would need to be carefully planned. All habitable spaces are located more than 500mm above the top water levels for attenuation systems for the 1 in 100-year event and are at no perceivable risks of flooding.

5.4 Mitigation Measures

Proposed mitigation measures to address residual flood risks are summarised below;

Mitigating Measure M1: The proposed drainage system including the attenuation tanks and SuDS features are to be maintained on a regular basis to reduce the risk of a blockage. A maintenance contract for the petrol interceptors should be entered into with a specialist maintenance company by each unit owner.

Mitigating Measure M2: The drainage network is designed in accordance with the recommendations of the GDSDS and provides attenuated outlets and associated storage up to the 100-year event. The drainage network for the site has been designed to ensure that it can accommodate the 1 in 100-year rainfall event in surcharged conditions.

Mitigating Measure M3: Overland flow routes for pluvial events should not be built on or become blocked off. Overland flow routes should be designed to direct to water compatible development areas and to other open space areas away from dwellings.

Mitigating Measure M4: At detailed design stage, the location of all dropped kerbs and side inlet gullies to be fully reviewed to ensure all overland flow paths are not impeded.

Mitigating Measure M5: The proposed development is deemed compatible with flood zone category 'C'. Therefore, the guidelines sequential approach is met, and a justification test is not required.

Mitigating Measure M6: Sustainable Urban Infrastructure: the development will include SUDS features e.g. green roofs, attenuation system, swales etc. incorporating infiltration and storage. These features will be maintained as part of M1

Mitigating Measure M7: The attenuation tank will be designed to resist hydrostatic uplift.

5.5 Impact of Proposals on flood risk to adjacent areas

The mitigation measures detailed above have been designed to prevent displacing the flood risk to adjacent areas. All runoff from the site will be directed to the proposed surface water sewers, and in-turn collected in the proposed attenuation system prior to controlled discharge to the receiving public surface water sewer in Ballymount Avenue. In the case of a flood event in exceedance of the 1:100 year design event leading to surcharging of the network, then overland flow paths will direct runoff to open spaces and SUDS features within the site.

6 RESIDUAL RISKS

Remaining residual flood risks, following the detailed assessment and mitigation measures include the following;

- Pluvial flooding from the drainage system related to a pipe blockage or from flood exceedance.
- Pluvial flooding from the development's drainage system for storms in excess of the 100-year design capacity.

7 CONCLUSION

This Site-Specific Flood Risk Assessment for the proposed development was undertaken in accordance with the requirements of the Planning System and Flood Risk Management Guidelines for Planning Authorities", November 2009. Following the flood risk assessment stages, it was determined that the site is within Flood Zone C as defined by the Guidelines and based on the ECFRAMS mapping. Therefore, the development of warehousing/logistics, office buildings and restaurant/café on the subject site is appropriate for the site's flood zone category and a justification test as outlined in the Guidelines is not required. The Guidelines sequential approach is met with the 'Justify' & 'Mitigate' principals being achieved.

The proposed flood mitigation measure(s) outlined in Section 5.4 should be implemented. It is considered that the flood risk mitigation measures once fully implemented are enough to provide a suitable level of protection to the proposed development and will not cause an increased risk of flooding to external properties or to the downstream watercourse.

A regularly maintained drainage system, including SuDS features, Petrol Interceptor and below ground network ensures that the network remains effective and in good working order should a large pluvial storm occur. In the event of extreme pluvial flooding then overland flood routes would direct water towards the open space areas.

Should extreme pluvial flooding occur in excess of the development's drainage capacity i.e. exceeding 1%AEP, then overland flood routes towards the on-site open spaces would protect the development and dwellings with lowest proposed floor levels.

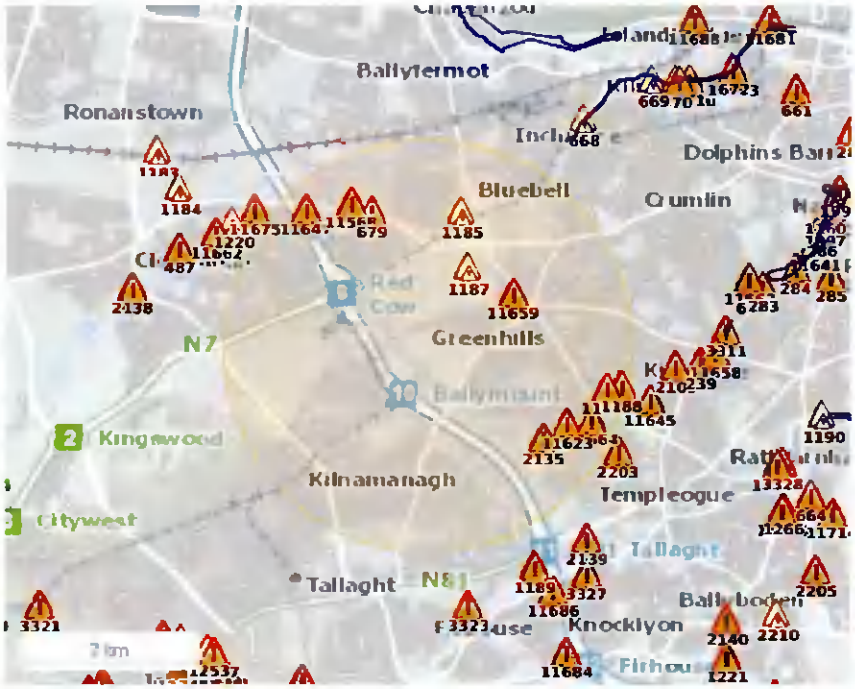
While the development constitutes 'a less vulnerable' development, it is appropriate for this flood zone and the scheme will be designed to ensure that the risk of flooding of the development is reduced as far as is reasonably practicable. The development does not increase the risk of flooding to adjacent area and roads once mitigation measures are implemented.

Appendix A: Site Flood Event Report

Past Flood Event Local Area Summary Report

Report Produced: 8/3/2022 15:32

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



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*

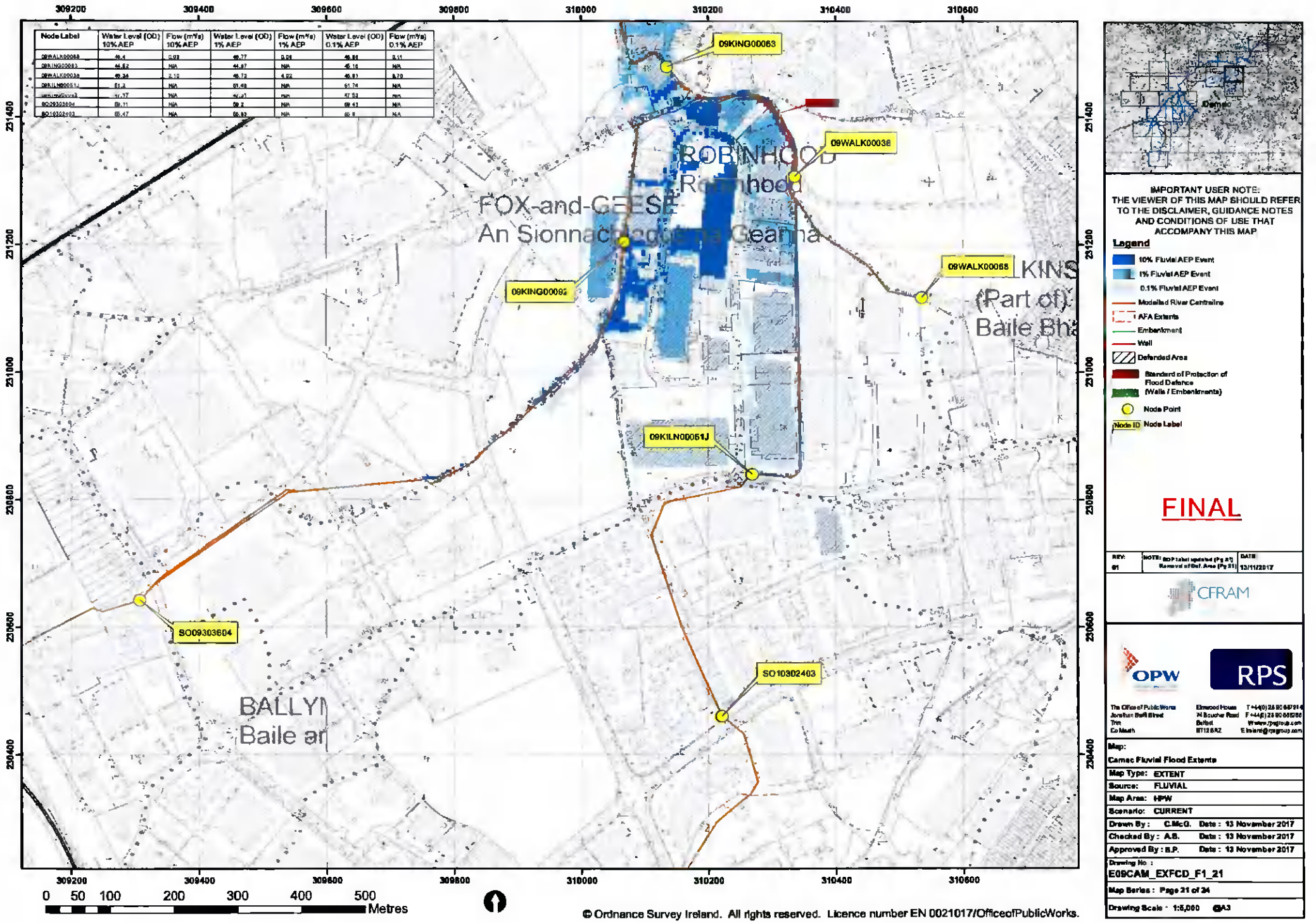
* Important: These maps do not indicate flood hazard or flood extent. Their purpose and scope is explained on Floodinfo.ie

13 Results

	Name (Flood_ID)	Start Date	Event Location
1.	Camac November 2000 (ID-679)	05/11/2000	Approximate Point
	Additional Information: Reports (1) Press Archive (0)		
2.	Camac Culvert Old Naas Road recurring (ID-1185)	n/a	Approximate Point
	Additional Information: Reports (2) Press Archive (0)		
3.	Robinhood Stream Walkinstown Recurring (ID-1187)	n/a	Approximate Point
	Additional Information: Reports (3) Press Archive (0)		
4.	Whitehall Road Kimmage Recurring (ID-1188)	n/a	Approximate Point
	Additional Information: Reports (2) Press Archive (0)		
5.	Poddle River Whitehall Road June 1993 (ID-2112)	11/06/1993	Approximate Point
	Additional Information: Reports (1) Press Archive (0)		
6.	Osprey Estate Nov 1982 (ID-2135)	05/11/1982	Exact Point
	Additional Information: Reports (1) Press Archive (0)		

	Name (Flood_ID)	Start Date	Event Location
7.	Flooding at Diageo, Nangor Road, Dublin 12 on 24th Oct 2011 (ID-11568) Additional Information: Reports (1) Press Archive (0)	24/10/2011	Approximate Point
8.	Flooding at Limekiln Road, Ballyboden Rd, Co. Dublin on 24th Oct 2011 (ID-11623) Additional Information: Reports (1) Press Archive (0)	24/10/2011	Approximate Point
9.	Flooding at Riverview Business Centre, New Nangor Road, Dublin 12 on 24th Oct 2011 (ID-11647) Additional Information: Reports (1) Press Archive (0)	24/10/2011	Exact Point
10.	Flooding at Robinhood Industrial Estate, Clondalkin, Dublin 12 on 24th Oct 2011 (ID-11654) Additional Information: Reports (1) Press Archive (0)	24/10/2011	Exact Point
11.	Flooding at Walkinstown Crescent, Walkinstown, Dublin 12 on 24th Oct 2011 (ID-11659) Additional Information: Reports (1) Press Archive (0)	24/10/2011	Exact Point
12.	Flooding at Wellington Lane, Dublin 24 on 24th Oct 2011 (ID-11664) Additional Information: Reports (1) Press Archive (0)	24/10/2011	Exact Point
13.	Flooding at Whitehall Road, Templeogue, Dublin 6W on 24th Oct 2011 (ID-11666) Additional Information: Reports (1) Press Archive (0)	24/10/2011	Exact Point

Appendix B: ECFRAMS Mapping



Node Label	Water Level (OD) 10% AEP	Flow (m³/s) 10% AEP	Water Level (OD) 1% AEP	Flow (m³/s) 1% AEP	Water Level (OD) 0.1% AEP	Flow (m³/s) 0.1% AEP
09WALK00088	46.4	0.03	46.77	0.05	46.86	0.11
09KING00083	44.82	NA	44.87	NA	45.16	NA
09WALK00038	46.34	2.19	46.73	4.82	46.83	8.79
09KILN00051J	61.3	NA	61.48	NA	61.74	NA
[illegible]	47.17	NA	47.41	NA	47.53	NA
SO09303604	59.11	NA	59.2	NA	59.43	NA
SO10302403	65.47	NA	65.53	NA	65.9	NA

IMPORTANT USER NOTE:
THE VIEWER OF THIS MAP SHOULD REFER TO THE DISCLAIMER, GUIDANCE NOTES AND CONDITIONS OF USE THAT ACCOMPANY THIS MAP

Legend

- 10% Fluvial AEP Event
- 1% Fluvial AEP Event
- 0.1% Fluvial AEP Event
- Modelled River Centreline
- AFA Extents
- Embankment
- Wall
- Defended Area
- Standard of Protection of Flood Defence (Walls / Embankments)
- Node Point
- Node ID Node Label

FINAL

REV:	NOTE:	DATE:
01	SOP label updated (Pg 21) Removal of Def. Area (Pg 21)	13/11/2017

CFRAM

OPW

RPS

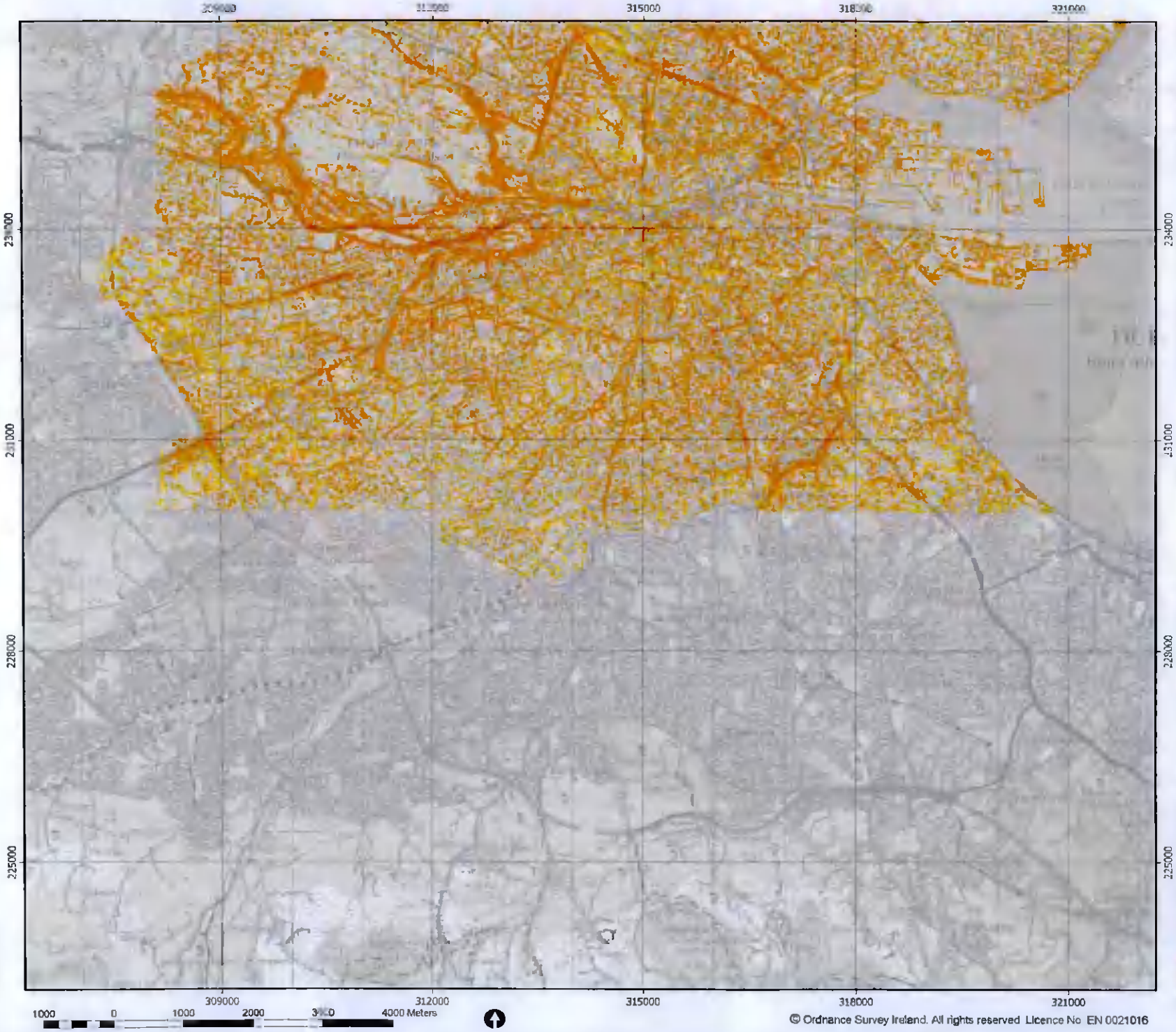
The Office of Public Works
Jonathan Swift Street
Trim
Co Meath

Elmwood House
74 Boucher Road
Belfast
BT12 6RZ

T +44(0) 28 90 667914
F +44(0) 28 90 665290
W www.rpsgroup.com
E belfast@rpsgroup.com

Map:	Carnac Fluvial Flood Extents
Map Type:	EXTENT
Source:	FLUVIAL
Map Area:	HPW
Scenario:	CURRENT
Drawn By :	C.McG. Date : 13 November 2017
Checked By :	A.B. Date : 13 November 2017
Approved By :	B.P. Date : 13 November 2017
Drawing No :	E09CAM_EXFCD_F1_21
Map Series :	Page 21 of 24
Drawing Scale :	1:5,000 @A3

Appendix C: FloodResilienCity Mapping (Pluvial)



Location Plan:

LEGEND

- 10% AEP Pluvial
- 1% AEP Pluvial
- 0.5% AEP Pluvial

IMPORTANT USER NOTE
THE VIEWER OF THIS MAP SHOULD REFER TO THE DISCLAIMER, GUIDANCE NOTES AND CONDITIONS OF USE THAT ACCOMPANY THIS MAP.

OPW

The Office Of Public Works
Jonathan Swift Street
Trim
Co Meath

Dublin City Council

Dublin City Council
Civic Offices
Wood Quay
Dublin 8

Project

DUBLIN PLUVIAL STUDY (FloodResilienCity)

Map	DUBLIN CITY - PLUVIAL FLOOD EXTENT MAP
Map Type	EXTENT - 180min Rainfall
Source	PLUVIAL
Map Area	URBAN
Scenario	CURRENT
Drawn by	IH Date Aug - 2016
Checked by	MC Date Aug - 2016
Approved by	JM Date Aug - 2016
Map No	1[illegible]9DCC_EXPCD_F0_03
Revision	F0
Map Scale 1:50,000	Plot Scale 1:1 @ A3