

Proposed Strategic Housing Development on Lands at Palmerstown Retail Park, Kennelsfort Road Lower, Palmerstown, Dublin 20

Flood Risk Assessment

Randelswood Holdings Ltd.

Project number: 60556657

10 April 2020

Quality information

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Table of Contents

1.	Introduction	5
1.1	Proposed Development	5
1.2	Nature of the Proposed Development.....	6
2.	The Planning System and Flood Risk Management Guidelines	7
3.	Flood Risk Identification.....	8
3.1	Coastal Flood Risk.....	8
3.2	Fluvial Flood Risk	8
3.3	Pluvial Flooding	9
3.4	Historic Flood Events in Palmerstown Upper.....	11
4.	Flood Risk Assessment.....	12
4.1	Sources of Flooding.....	12
4.2	Flood Zone	12
4.3	Vulnerability	12
5.	Conclusions	13
	Appendix A – CFRAM Fluvial Flood Extent Map	14

Figures

Figure 1 – Site Location – Palmerstown, Dublin 20.....	5
Figure 4 – Location of Proposed Development Demonstrating Proximity to the River Liffey	8
Figure 5 – Extract of Eastern CFRAM Map E09LUC_EXFCD_F0_10	9
Figure 6 – Flood zones in Palmerstown Upper as defined by OPW PFRA Maps (www.myplan.ie)	10
Figure 7 – SDCC Drainage Record Drawing.....	10
Figure 8 – Historic Flood Events in Palmerstown Upper (www.floodmaps.ie).....	11

Tables

Table 1 - Vulnerability and appropriate flood zones – Excerpt of Table 3.2 of the Planning System	12
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1. Introduction

1.1 Proposed Development

AECOM Ireland have been appointed by Randelswood Holdings Ltd to carry out a Flood Risk Assessment (FRA) report for a proposed Strategic Housing Development at Palmerstown, Dublin 20.

The FRA has been carried out in support of a planning application for the proposed development that will be submitted to An Bord Pleanála and in full compliance with the requirements of “The Planning System & Flood Risk Management Guidelines” published by the Department of the Environment in November 2009.

The site currently comprises of the existing Palmerstown Retail Park (N4 Car Sales) and is accessed off Kennelsfort Road Lower.

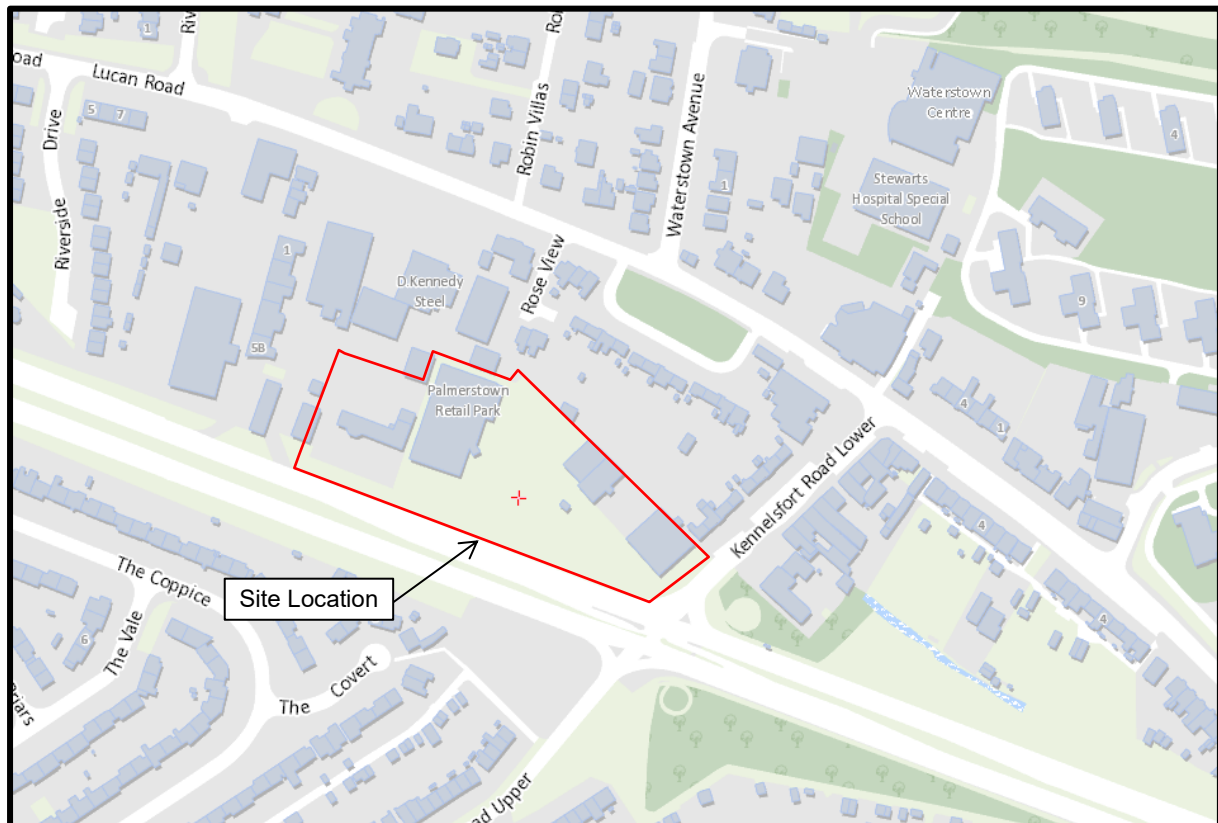


Figure 1 – Site Location – Palmerstown, Dublin 20

1.2 Nature of the Proposed Development

The proposed development will consist of the demolition of all existing structures on site and the construction of a residential and mixed-use development of 250 No. apartments units and its ancillary works, over 5 No. Blocks.

The development also includes the construction of a basement providing car parking space, motorbike spaces, bicycle spaces, plant room and bin stores. The proposal also incorporates modifications to the vehicular access onto Kennelsfort Road Lower, 1 No. ESB sub-station; landscaping including upgrades to public realm, public lighting, boundary treatments and all associate engineering and site works necessary to facilitate the development.

The overall site area is 1.268 ha. The site is bounded to the north by existing retail and residential units, the south by the R148, the east by Kennelsfort Road Lower and to the west by further existing retail units.

There will be 2 no. access locations serving the subject site on Kennelsfort Road Lower and on Old Lucan Road (via Palmerstown Business Park), both access points are to serve pedestrians, cyclists and vehicles.

The layout of the proposed scheme is detailed in drawings submitted by Downey Architects accompanying this submission.

1.2 Nature of the Proposed Development

The proposed development will consist of the demolition of all existing structures on site and the construction of a residential and mixed-use development of 250 No. apartments units and approximately 1,024m² of commercial area (comprising meeting room, games room and gym facility) over 5 No. Blocks.

The development also includes the construction of a basement providing car parking space, motorbike spaces, bicycle spaces, plant room and bin stores. The proposal also incorporates modifications to the vehicular access onto Kennelsfort Road Lower, 1 No. ESB sub-station; landscaping including upgrades to public realm, public lighting, boundary treatments and all associate engineering and site works necessary to facilitate the development.

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2. 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.

The Flood Risk Management Guidelines give guidance on flood risk and development. The guidelines recommend a precautionary approach when considering flood risk management in the planning system. The core principle of the guidelines is to adopt a risk based 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 below. It should be noted that these do not take into account the presence of flood defences, as risks remain of overtopping and breach of the defences.

Zone A (high probability of flooding) is for lands where the probability of flooding is greatest (greater than 1% or the 1 in 100 for river flooding and 0.5% or 1 in 200 for coastal flooding).

Zone B (moderate probability of flooding) refers to lands where the probability of flooding is moderate (between 0.1% or 1 in 1000 and 1% or 1 in 100 for river flooding and between 0.1% or 1 in 1000 and 0.5% or 1 in 200 for coastal flooding).

Zone C (low probability of flooding) refers to lands where the probability of flooding is low (less than 0.1% or 1 in 1000 for both river and coastal flooding).

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. We also note that the current South Dublin City Development Plan (2011-2017) was adopted following the publication of the Flood Risk Management Guidelines.

A three staged approach to undertaking a FRA is recommended:

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

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

Detailed Flood Risk Assessment (Stage 3) - 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 stages 1 and 2.

3. Flood Risk Identification

The development is situated approximately 750m south of River Liffey (refer to Figure 2), which may generate a fluvial flood risk. A pluvial flood threat may also exist at the site. Potential flooding from these threats will be considered in greater detail in the following sections.

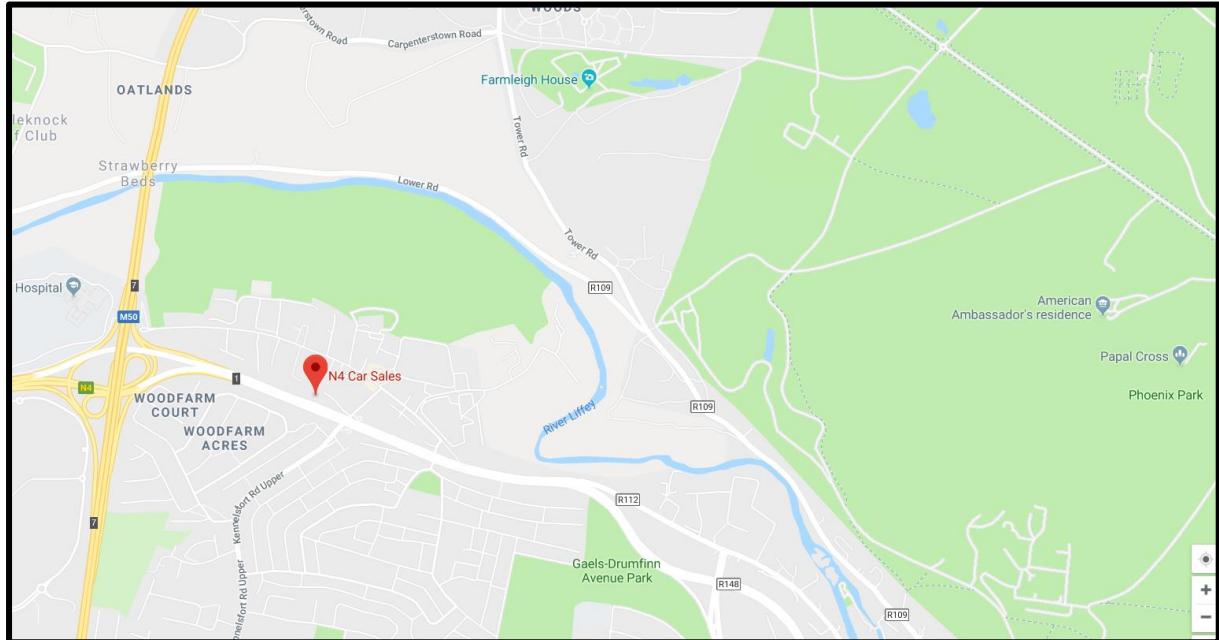


Figure 2 – Location of Proposed Development Demonstrating Proximity to the River Liffey

3.1 Coastal Flood Risk

Coastal flooding results from sea levels which are higher than normal and result in sea water overflowing onto the land. Coastal flooding is influenced by the following three factors which often work in combination: high tide level, storm surges and wave action.

There is no risk associated with coastal flooding for this site as general ground levels for the site (circa 45.00mOD) are much higher than expected extreme coastal flood levels.

3.2 Fluvial Flood Risk

Fluvial flooding is the result of a river exceeding its capacity and excess water spilling out onto the adjacent floodplain.

The Eastern Catchment Flood Risk Assessment and Management (CFRAM) study commenced in the Eastern district in June 2011 through the end of 2016. The study is focusing on areas known to have experienced flooding in the past and areas that may be subject to flooding in the future either due to development pressures or climate change.

Figure 3 is an extract of the Eastern CFRAM Map E09LUC_EXFCD_F0_10 dated 27 July 2016 and indicates that there is no fluvial flooding threat to the site of the proposed development. Please refer to Appendix A for the full map.

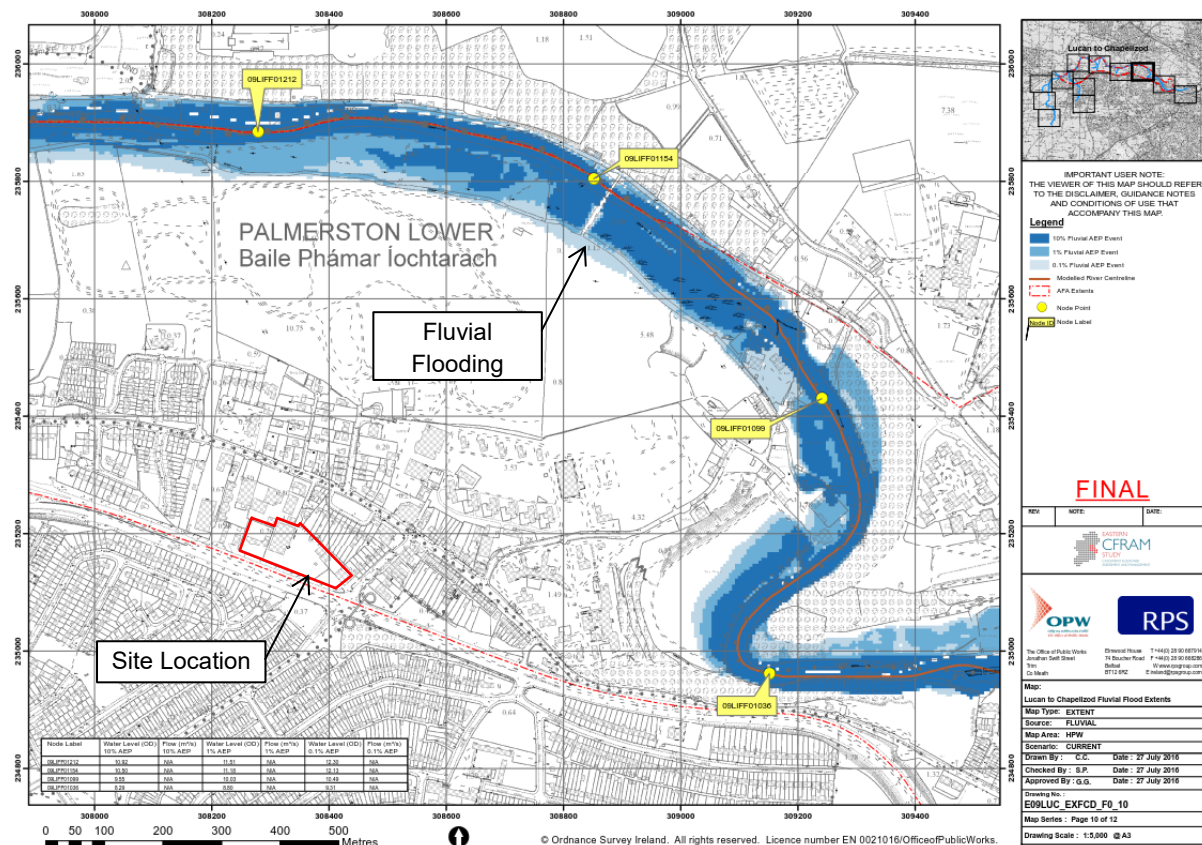


Figure 3 – Extract of Eastern CFram Map E09LUC_EXFCD_F0_10

AECOM are aware that it has been suggested that an underground stream exists on the site and this indeed has been identified on some very old GSI maps.

We would point out, however, that this is not reference on any of the more up to date flood maps or reports. In the interests of completeness, our Client is commissioning some slit trenching on the site to identify whether the underground stream exists or not. If the underground stream does still exist, it will be diverted around the perimeter of the site to ensure it continues to feed any downstream features

3.3 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 and typically occurs in the summer months.

Myplan.ie map incorporates many different sets of spatial information, including OPW Preliminary Flood Risk Assessment (PFRA) mapping data (fluvial, pluvial, coastal flooding data and groundwater flood extents).

Figure 4 is an extract from www.myplan.ie and illustrates areas that might be at risk of pluvial flooding in the vicinity of the site.

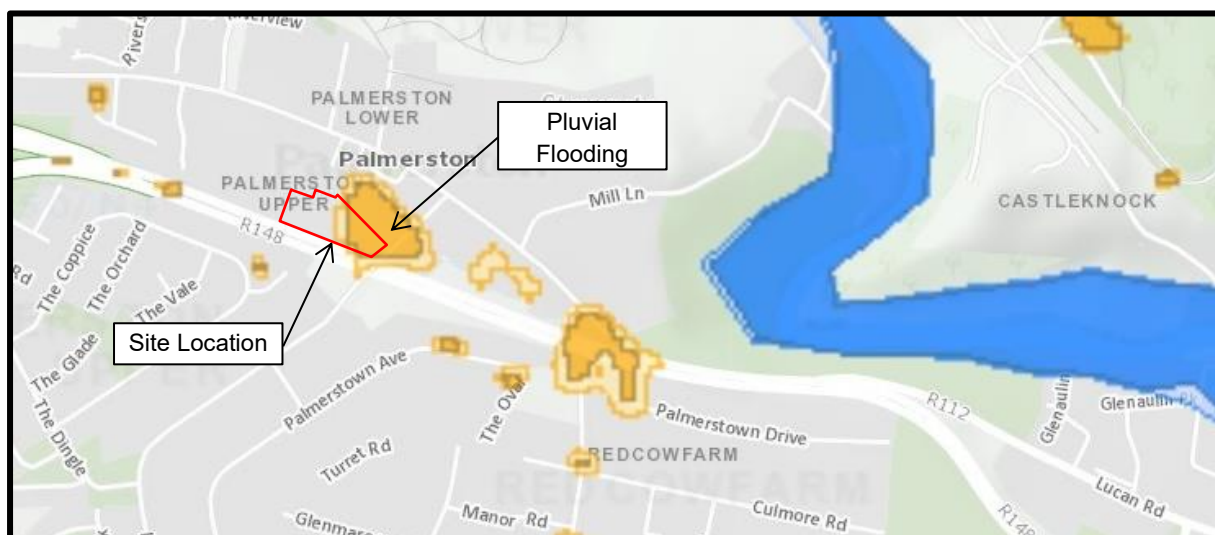


Figure 4 – Flood zones in Palmerstown Upper as defined by OPW PFRA Maps (www.myplan.ie)

It is noted that an area located to the east partly covering the subject site is at risk from pluvial flooding in the existing scenario. It is considered that this is due to the high percentage of site being hardstanding and therefore generating a large volume of runoff which cannot enter the sewers. This appears to be consistent with the increase in diameter encountered in the surface water system as the site does not benefit in the existing scenario of surface water runoff attenuation (refer to Figure 5).

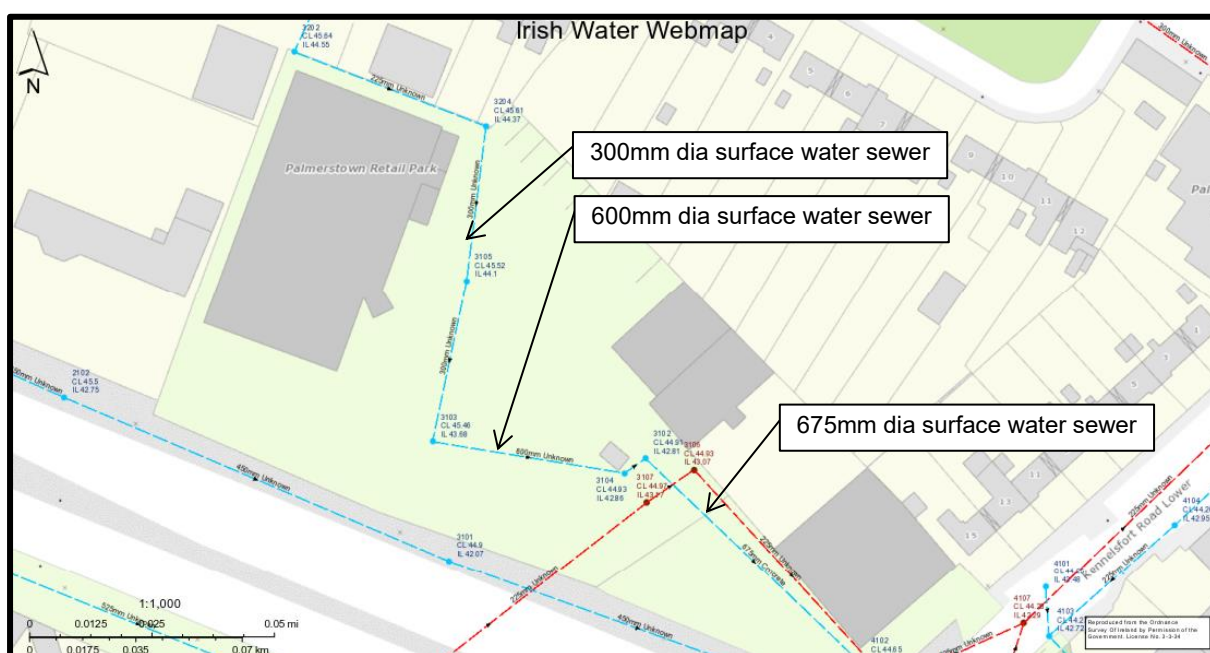


Figure 5 – SDCC Drainage Record Drawing

However, it is important to mention that the site will be developed and will be carefully managed in terms of surface water runoff for significant rainfall events. The proposed design will remove this local low point within the site through an engineered drainage system. The surface water drainage network will be designed to cater for storm water from both roof of the buildings and podium areas on the entire premises of the development in accordance with the Greater Dublin Strategic Drainage Study (GDSDS) and will contain the 1 in 100 year event plus 20% climate change allowance.

3.4 Historic Flood Events in Palmerstown Upper

The OPW Flood Hazard Mapping Website is a record of historic flood events and this database indicates that there is no reported incident of flooding in the vicinity of the site of the proposed development. Please refer to Figure 6 for the extract of the OPW Historical Map.

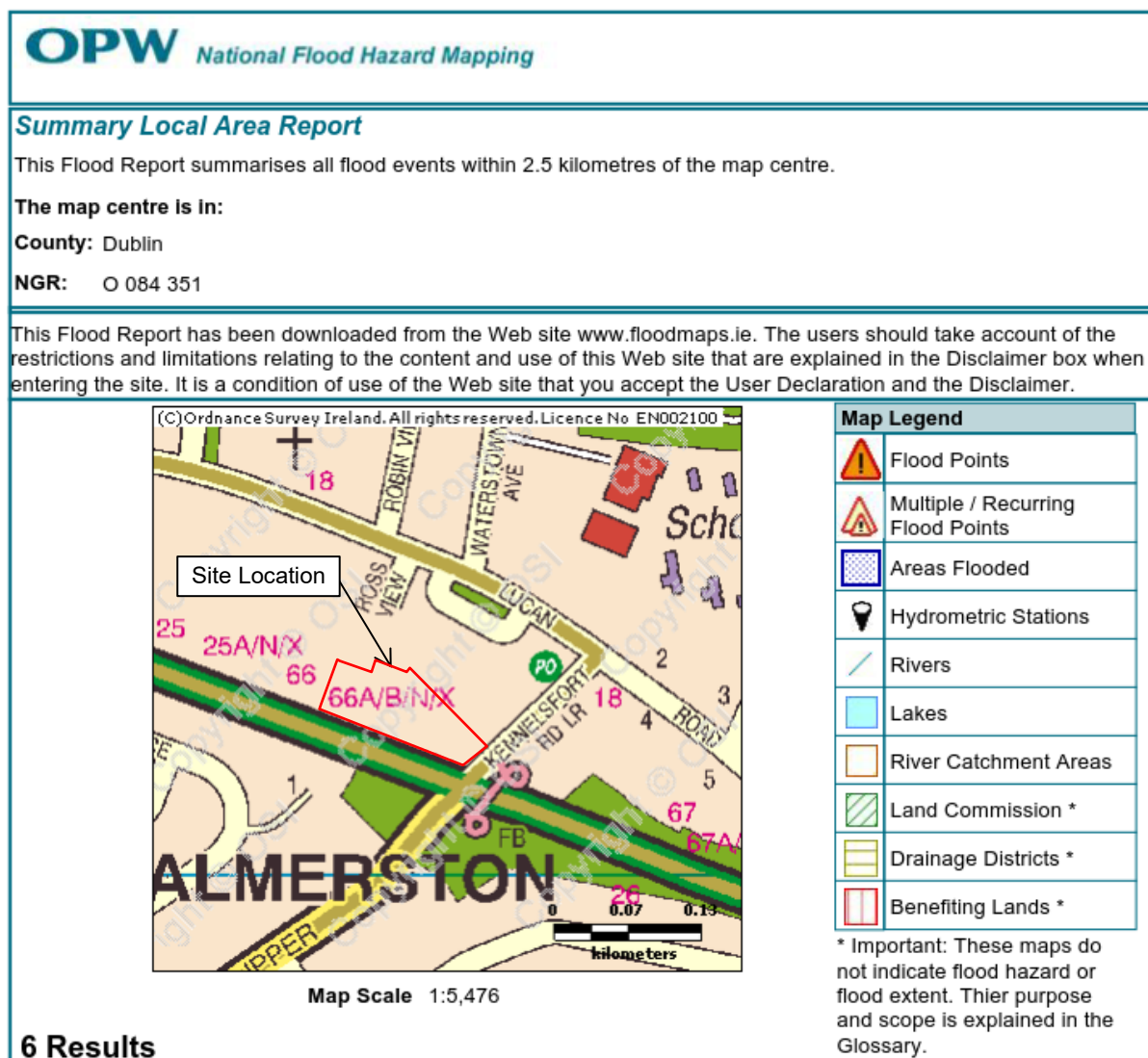


Figure 6 – Historic Flood Events in Palmerstown Upper (www.floodmaps.ie)

4. Flood Risk Assessment

4.1 Sources of Flooding

When carrying out a flood risk assessment one should consider all the potential flood risks and sources of flood water at the site. In general the relevant flood sources are:

- **Coastal**

Coastal flooding is the result of sea levels which are higher than normal and result in sea water overflowing onto the land. Given the location of the development so far inshore and that the general ground levels for the site (45.00mOD) are much higher than the expected coastal flood levels, it is concluded there is no risk associated with coastal flooding for this site (see section 3.1).

- **Fluvial**

Fluvial flooding is the result of a river exceeding its capacity and excess water spilling out onto the adjacent floodplain. The Eastern CFRAM mapping indicates that there is no fluvial flooding threat to the site of the proposed development. (see section 3.2).

- **Pluvial**

Pluvial flooding is the result of rainfall-generated overland flows which arise before runoff can enter any watercourse or sewer. It is usually associated with high intensity rainfall. As the site consists of high percentage of hardstanding surface a large volume of runoff is generated during extreme rainfall events. The existing drainage strategy on site appears to have considered an increase in diameters of the surface water sewers in order to cope with the large volumes of runoff, but if the number of gullies isn't sufficient or the gullies are not properly maintained it could lead to ponding/ pluvial flooding (see section 3.3).

It is noted that no instances of pluvial flooding were recorded on site (see section 3.4).

However, the site will be developed and will be carefully managed for surface water runoff and attenuation will be in place to cater for the 1 in 100 year rainfall event.

4.2 Flood Zone

With reference to Section 3 above, it is concluded that the subject site is located in Flood Zone C with reference to coastal and fluvial flooding. Flood Zone C is defined in the Planning System and Flood Risk Management Guidelines where the probability of flooding from rivers and the sea is low (less than 0.1% or 1 in 1000 year return for both river and coastal flooding).

4.3 Vulnerability

Table 3.1 of the Planning System and Flood Risk Management Guidelines for Planning Authorities gives a detailed classification of vulnerability of different types of development. Buildings with a residential element are classed as less vulnerable developments and these are considered a suitable land use for Flood Zone C (please see Table 2) and negates the requirement for a Justification Test.

Table 1 - Vulnerability and appropriate flood zones – Excerpt of Table 3.2 of the Planning System and Flood Risk Management Guidelines

	Flood Zone A	Flood Zone B	Flood Zone C
Highly vulnerable development (including essential infrastructure)	Justification Test	Justification Test	Appropriate
Less vulnerable development	Justification Test	Appropriate	Appropriate
Water-compatible development	Appropriate	Appropriate	Appropriate

5. Conclusions

This flood risk assessment was prepared for the purposes of assessing the flood risk to the proposed residential and mixed-use development at Palmerstown, Dublin 20.

As general ground levels for the site (circa 45.00mOD) are much higher than expected extreme coastal flood levels it is considered there is no risk associated with coastal flooding for this site.

Given the proximity of the development to the River Liffey, flood risk from this watercourse has been reviewed. Eastern CFRAM mapping indicates that there is no fluvial flooding threat to the site of the proposed development.

Therefore, it is concluded that the subject site is located in Flood Zone C with respect to coastal and fluvial flooding. Buildings with a residential element are classed as highly vulnerable developments and these are considered a suitable land use for Flood Zone C which also negates the need for a Justification Test.

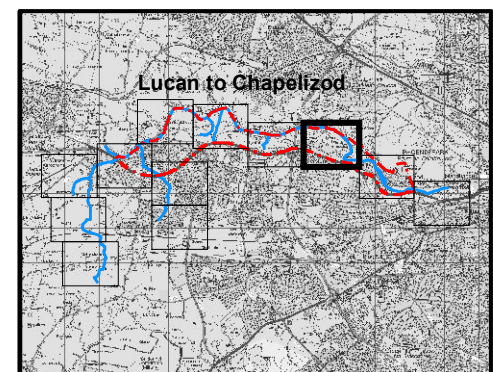
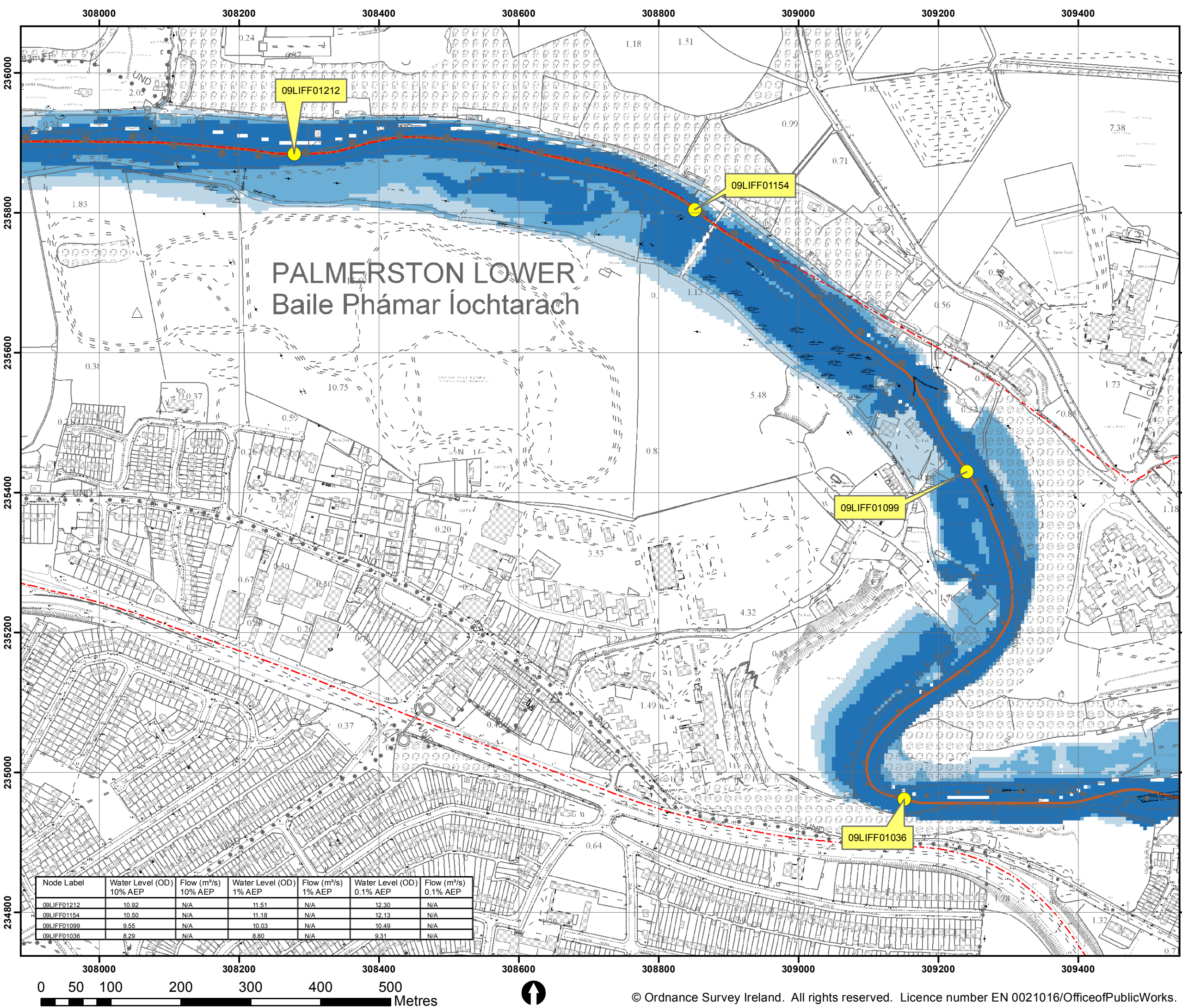
A review of the www.myplan.ie map which incorporates the OPW Preliminary Flood Risk Assessment (PFRA) mapping data (pluvial flood extents) indicates that an area located to the east partly covering the subject site is at risk from pluvial flooding in the existing scenario. It is considered that this is due to the high percentage of site being hardstanding and therefore generating a large volume of runoff which cannot enter the sewers. However, the site in the proposed scenario will be developed and carefully managed for surface water runoff and attenuation will be in place to cater for the 1 in 100-year rainfall event.

We note that in case of emergency there is vehicular access for Fire and Ambulance services to the building from all roads around the proposed development.

Residual flood risk will be managed through the use of emergency plans and evacuation procedures.

It is also noted that the proposed development will not increase the flood risk elsewhere.

Appendix A – CFRAM Fluvial Flood Extent Map



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
 - Node Point
 - Node ID Node Label

FINAL

REV:	NOTE:	DATE:
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Map:	
Lucan to Chapelizod Fluvial Flood Extents	
Map Type:	EXTENT
Source:	FLUVIAL
Map Area:	HPW
Scenario:	CURRENT
Drawn By :	C.C.
Date :	27 July 2016
Checked By :	S.P.
Date :	27 July 2016
Approved By :	G.G.
Date :	27 July 2016
Drawing No. :	
E09LUC_EXFCD_F0_10	
Map Series : Page 10 of 12	
Drawing Scale : 1:5,000 @ A3	

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
09LIFF01212	10.92	N/A	11.51	N/A	12.30	N/A
09LIFF01154	10.50	N/A	11.18	N/A	12.13	N/A
09LIFF01099	9.55	N/A	10.03	N/A	10.49	N/A
09LIFF01036	8.29	N/A	8.80	N/A	9.31	N/A

