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Kildare County Council

Proposed Development of 77 no. Residential Units at College Wood Manor, Ballingappa Road, Clane, Co. Kildare.

Site Specific Flood Risk Assessment



2B Richview Office Park
Clonskeagh
Dublin 14

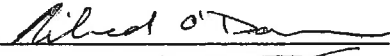
Contents Amendment Record



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Title: Proposed Development of 77 no. Residential Units at College Wood Manor, Ballingappa Road, Clane, Co. Kildare.
 Site Specific Flood Risk Assessment

Job Number: SHB2-NAN-CS-MOR-DOC -Site Specific Flood Risk Assessment

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1 INTRODUCTION

1.1 Introduction

Malone O'Regan have been commissioned to undertake a site-specific flood risk assessment in relation to a proposed residential development on College Wood Manor, Ballingappa Road, Clane, County Kildare. This report has been prepared to outline the findings of the assessment and to support a Part VIII planning application for the development.

The flood risk assessment has been carried out in accordance with the Government's 2009 Planning System and Flood Risk Management Guidelines (hereafter referred to as the 2009 Planning Guidelines). These guidelines adopt a staged approach to the assessment of flood risk.

This report describes a Stage 2 Initial Flood Risk Assessment which is defined within the 2009 Planning Guidelines as follows:

“A qualitative or semi-quantitative study to confirm sources of flooding that may affect a plan area or proposed development site, to appraise the adequacy of existing information, to provide a qualitative appraisal of the risk of flooding to development, including the scope of possible mitigation measures, and the potential impact of development on flooding elsewhere, and to determine the need for further detailed assessment.”

The assessment involved a desk study combined with a site visit. The study was principally focused on examining flooding risks to the proposed site from the nearby Betaghstown Stream.

2 THE SITE AND PROPOSED DEVELOPMENT

2.1 The Site

The proposed site is located along the College Wood Manor, which is off Ballinagappa Road (L1023). The site is approximately 1.0km to the west of Clane town centre. The site is located at the southern edge of an established residential area. Scoil Mhuire Community School and Scoil Phadraig Boys' National School are located immediately to the south of the site. To the north of the site is an established crèche. Clane Rugby Club is located to the east of the site.

The lands to the east and west are currently undeveloped greenfields. Lands to the west are zoned as residential use, and lands to the east are zoned for education and community.

The site has an overall area of 3.7 hectares. A topographical survey has been conducted which indicates that site generally slopes towards the existing ditchline. The existing ground level falls from a highest elevation of +80.50m at the northwest corner of the site to a lowest elevation of +75.82 in the southern point of the existing ditchline.

2.2 Surrounding Watercourses

As illustrated in Figure 2.1 there are no watercourses in the immediate vicinity of the site. The closest watercourses are the Betaghstown Stream (per EPA map) which is approximately 500m to the south of the site. Existing ditches on site fall to the south of the site and would discharge into the Betaghstown Stream.

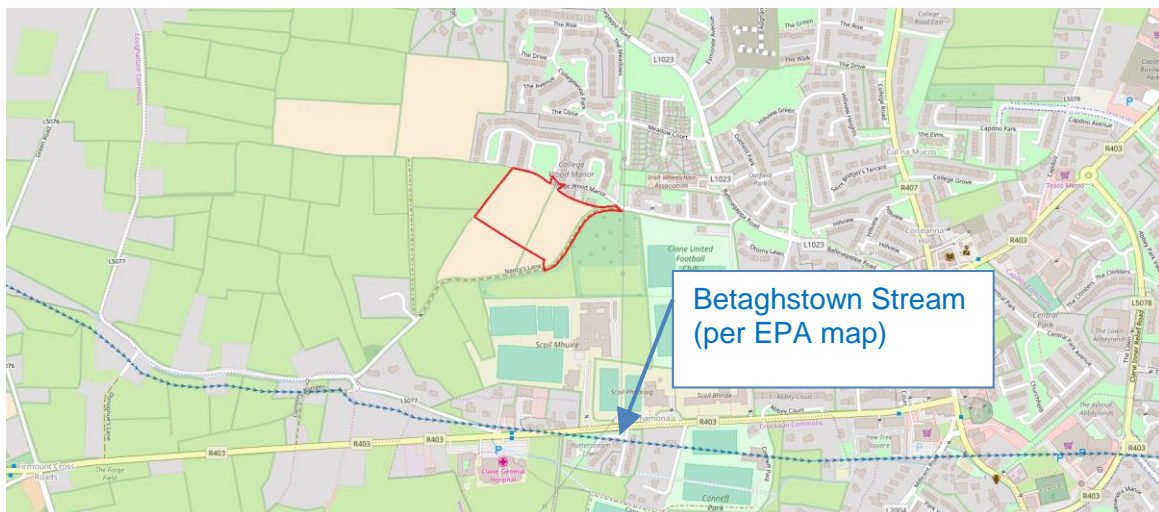


Figure 2.1 – Surrounding Watercourses

2.3 Site Visit

On 6th October 2016 Malone O'Regan visited the proposed site. The purpose of the site visit was to assess the topography of the area and identify potential sources of flood risk.

It was noted that there is a level difference between the existing ditchline and the surrounding land. The existing ditchlines include a fall in a southerly direction.

The site is split into four fields which are separated by mature trees and hedgerows. The majority of the proposed development will be located on the two fields at the eastern side of the site.

2.4 Proposed Development

The proposed development includes the construction of 77 residential properties as well as access roads, car parking bays and other ancillary utility services. Details of the proposed development are indicated on Malone O'Regan drawing SHB2-CLA-CS-MOR-DR-101.

3 FLUVIAL FLOOD RISK ASSESSMENT

The following sources of information were reviewed in order to identify any flood risk to the proposed development site as a result of fluvial flooding:

- The National Preliminary Flood Risk Assessment (PFRA) – Overview Report & Indicative Flood Maps (OPW, March 2012, www.cfram.ie)
- OPW Flood Records from www.floodmaps.ie
- Clane Local Area Plan 2017-2023.

3.1 The National Preliminary Flood Risk Assessment

The principal source of information used to establish the risk of flooding on the site is the Flood Risk Assessment (FRA) Maps from the Catchment Flood Risk Assessment and Management (CFRAM) Study. The relevant maps have been included within Appendix A of this report and extract from the maps are provided in the Figures below. Figure 3.1 indicates the extent of flooding associated with the Betaghstown Stream. These maps indicate the extent of flooding caused by a fluvial flood event with an annual exceedance probability (AEP) of 10% (10yr event), 1% (100yr event) and 0.1% (1000yr event). The final versions of the maps were published recently (July 2016) and are considered to be an accurate indication of the risk of flooding on the site.

From Figure 3.1 and the maps in Appendix A it can be seen that the site is predicted to remain unaffected by even the largest 1000-year storm events. Flooding is limited to the areas immediately alongside the Betaghstown Stream. It can therefore be concluded that there is no realistic risk of fluvial flooding to the site.

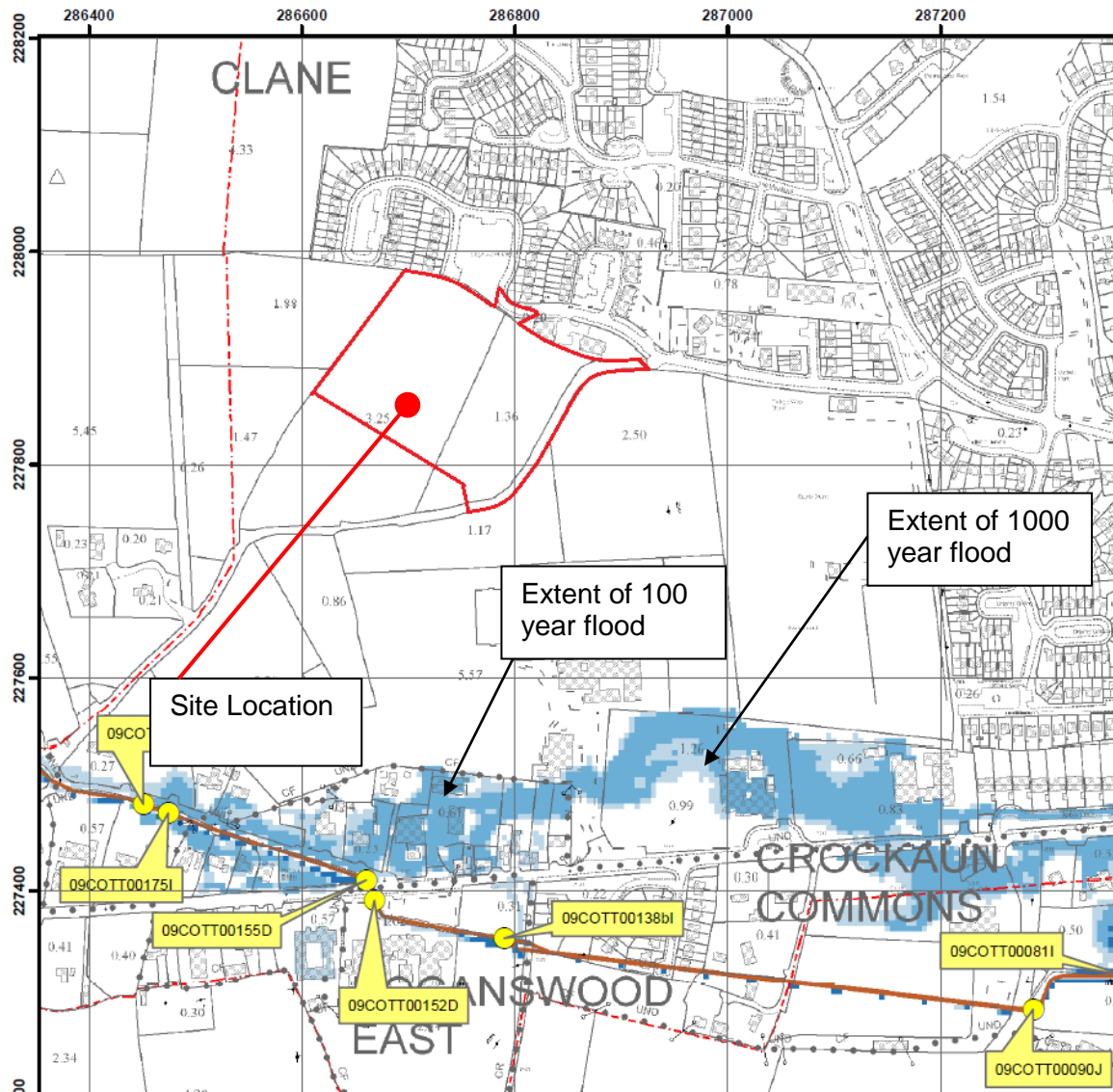


Figure 3.1 – Extract from PFRA Maps – Betaghstown Stream

The CFRAM Study also gives predicted water levels in the Betaghstown Stream. These levels are presented in Table 3.1 below, where all levels are in metres above ordnance datum. The location of the node points is indicated in Figure 3.1 and on the drawings in Appendix A.

Location	Node Label	Water Level 10% AEP	Water Level 1% AEP	Water Level 0.1% AEP
Betaghstown Stream	09LIFF04295	65.50	65.90	66.20

Table 3.1 – CFRAMS Predicted Water Levels

It can be seen that the flood levels predicted within the CFRAM Study for the Betaghstown Stream are significantly below the minimum ground level within the

proposed site (+75.82m). It can therefore be concluded that there is no realistic risk of fluvial flooding to the site.

3.2 *OPW Flood Records*

The Office of Public Works (OPW) maintain records of historical flood events in Ireland which are available for inspection on their website (www.floodmaps.ie). These records were examined and there were no recorded instances of historical flooding in the vicinity of the subject site.

3.3 *Clane Local Area Plan*

Map 9.1 of The Clane Local Area Plan 2017-2023 identifies a number of areas where the risk of flooding needs to be considered and any development justified using a site-specific flood risk assessment. This map is provided for reference in Appendix B of this report.

It is noted that the site is predicted to remain unaffected by storm events. The risk of flooding has been assessed in the preceding sections and the flood maps provided within the CFRAM Study show that there is no realistic risk of flooding to the site.

4 SEQUENTIAL APPROACH TO PLANNING

The document “Planning Systems and Flood Risk Management: Guidelines for Planning Authorities November 2009” requires the adoption of a sequential approach to flood risk management when assessing the location for new developments. This approach is a risk-based method to guide development away from areas that have been identified through flood risk assessment as being at risk from flooding. The philosophy used in this approach is outlined in figure 4.1 below.

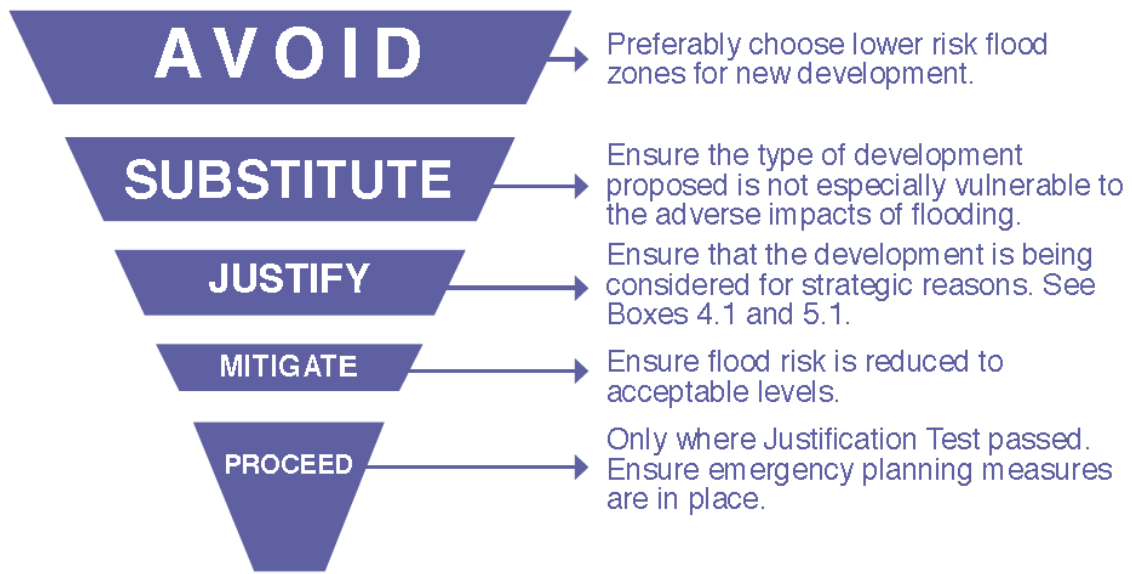


Figure 4.1 Source: *The Planning Systems and Flood Risk Management: Guidelines for Planning Authorities November 2009*

The sequential approach uses mapped flood zones alongside considerations of the vulnerability of different types of development to give priority to development in zones of low flood probability.

4.1 Flood Zones

The flood zones are defined on the basis of flooding from rivers and the sea. The different flood zones recommended in the 2009 Planning Guidelines are:

Flood Zone A – Highest risk area where there is a 1% chance of flooding in any one year from rivers and a 0.5% chance of flooding from the sea.

Flood Zone B – Moderate risk area where the chance of flooding in any one year is 0.1-1% for rivers and 0.1-0.5% for coastal flooding.

Flood Zone C – Low risk area with less than 0.1% chance of flooding from rivers or the sea in any given year.

As described in Section 3.1 above, the PFRA Maps from the CFRAM Study indicate that the proposed development is outside of the area predicted to flood during a 1 in 1000 year flood event. The development is therefore located within Flood Zone C.

4.2 Vulnerability Class of Proposed Development

The vulnerability class of the development is dependent on the land use and type of development proposed. See Table 4.1 for the vulnerability classes.

Vulnerability class	Land uses and types of development which include*:
Highly vulnerable development (including essential infrastructure)	<p>Garda, ambulance and fire stations and command centres required to be operational during flooding;</p> <p>Hospitals;</p> <p>Emergency access and egress points;</p> <p>Schools;</p> <p>Dwelling houses, student halls of residence and hostels;</p> <p>Residential institutions such as residential care homes, children’s homes and social services homes;</p> <p>Caravans and mobile home parks;</p> <p>Dwelling houses designed, constructed or adapted for the elderly or, other people with impaired mobility; and</p> <p>Essential infrastructure, such as primary transport and utilities distribution, including electricity generating power stations and sub-stations, water and sewage treatment, and potential significant sources of pollution (SEVESO sites, IPPC sites, etc.) in the event of flooding.</p>
Less vulnerable development	<p>Buildings used for: retail, leisure, warehousing, commercial, industrial and non-residential institutions;</p> <p>Land and buildings used for holiday or short-let caravans and camping, subject to specific warning and evacuation plans;</p> <p>Land and buildings used for agriculture and forestry;</p> <p>Waste treatment (except landfill and hazardous waste);</p> <p>Mineral working and processing; and</p> <p>Local transport infrastructure.</p>
Water-compatible development	<p>Flood control infrastructure;</p> <p>Docks, marinas and wharves;</p> <p>Navigation facilities;</p> <p>Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location;</p> <p>Water-based recreation and tourism (excluding sleeping accommodation);</p> <p>Lifeguard and coastguard stations;</p> <p>Amenity open space, outdoor sports and recreation and essential facilities such as changing rooms; and</p> <p>Essential ancillary sleeping or residential accommodation for staff required by uses in this category (subject to a specific warning and evacuation plan).</p>
*Uses not listed here should be considered on their own merits	

Table 4.1 Classification of Vulnerability to Flooding for Various Development Types

(Source – Table 3.1 Planning System and Flood Risk Management – Guidelines for Planning Authorities DEHLG, OPW, November 2009)

The 2009 Planning Guidelines presents a matrix of vulnerability versus flood zone to illustrate appropriate development and the requirement of justification tests. That matrix can be seen in Table 4.2. The proposed residential development is classified as a highly vulnerable development from Table 4.1. However, the development will be located in Flood Zone C and is therefore considered to be appropriate and a Justification Test is not therefore required.

	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

Table 4.2 - Matrix of Vulnerability vs. Flood Zone

(Source – Table 3.1 Planning System and Flood Risk Management – Guidelines for Planning Authorities DEHLG, OPW, November 2009)

5 OTHER FLOOD SOURCES

5.1 Pluvial Flooding

This type of flooding is typically caused by summer thunderstorms or high intensity rainfall during longer duration events. This flooding is then generated by overland flows prior to the run-off entering watercourses / sewers (pipe networks).

All runoff from the roofs of buildings will be collected into a number of downpipes and gullies and will discharge into the public sewers. External areas will generally be grassed or surfaced using permeable paving. No surface water runoff will be allowed to discharge onto adjoining lands. It is therefore highly unlikely that the site will be affected by pluvial flooding.

5.2 Coastal Flooding

The proposed development is not located in a coastal area and coastal flooding is not considered to be a significant risk.

5.3 Groundwater Flooding

Groundwater flooding occurs as a result of water rising up from underlying soils or from water flowing from abnormal springs. This tends to occur only after long periods of sustained high rainfall.

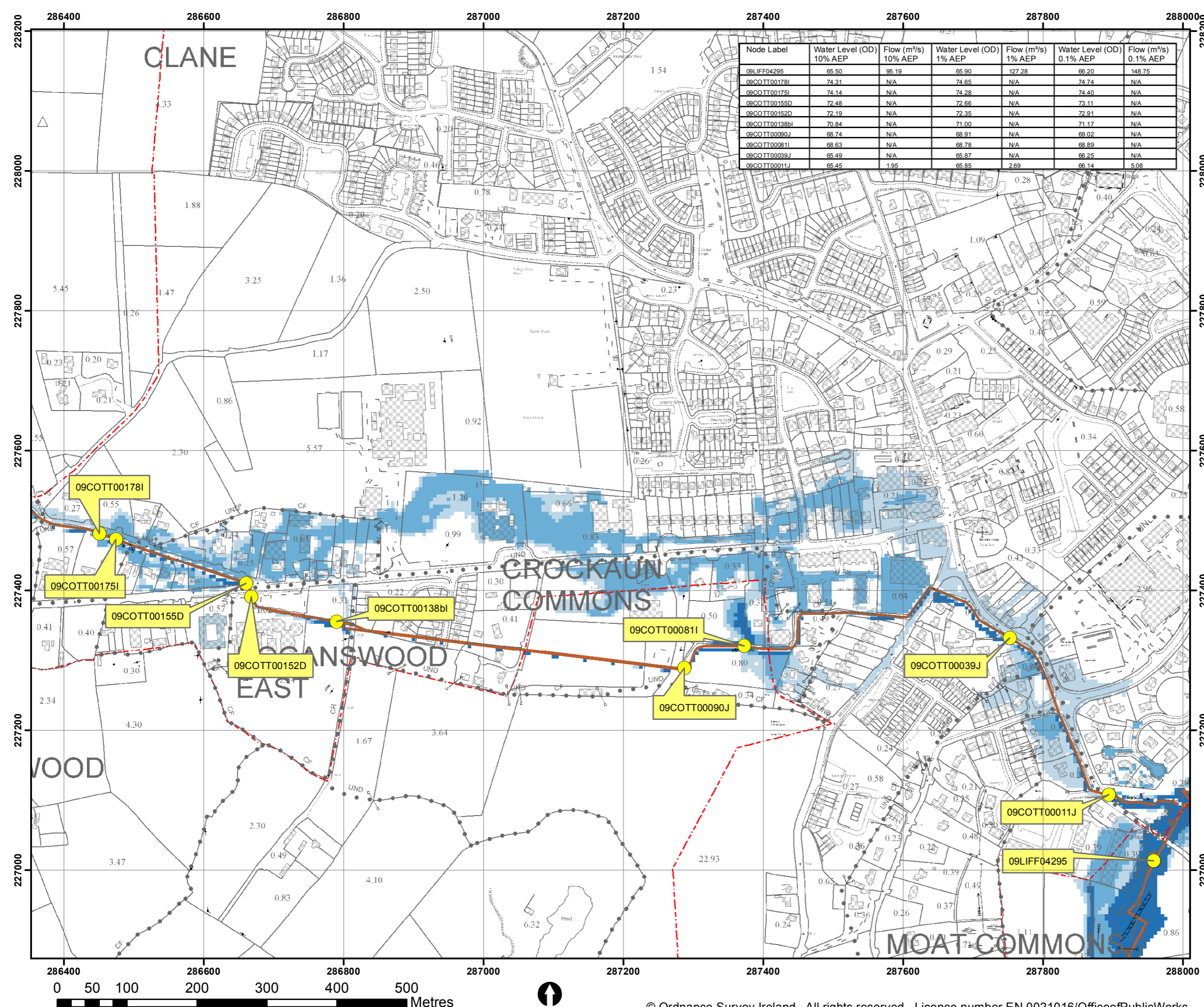
The OPW Preliminary Flood Risk Assessments Groundwater Flooding Report concludes that groundwater flooding is largely confined to the west coast of Ireland, due to the hydrogeology of that area. The site is therefore not considered to be at risk of groundwater flooding.

6 CONCLUSIONS FROM FLOOD RISK ASSESSMENT

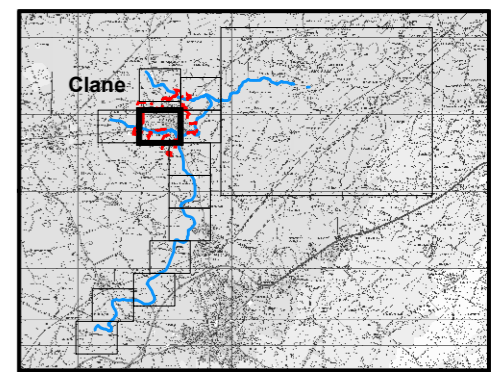
6.1 Conclusions

- The risk of flooding on the proposed development site has been considered using available primary sources of flooding information. This assessment demonstrates that the entirety of the site is not at risk from flooding from either a 1 in 100yr or a 1 in 1000yr storm event.
- The FRA maps contained within the CFRAM Study show that there is no realistic risk of flooding on the site. The maximum predicted 1000 year flood level within the Betaghstown Stream is +65.90m. The minimum ground level within the proposed development is +75.82m.
- A sequential approach to flood risk management was adopted in accordance with the 2009 Planning Guidelines. After assessing the flooding risk, the proposed residential development is considered to be appropriate in this location.

APPENDIX A – PFRA MAPS FROM EASTERN CFRAM STUDY



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
09LIFF04295	65.50	95.19	65.90	127.28	66.20	148.75
09COTT00178I	74.31	N/A	74.65	N/A	74.74	N/A
09COTT00175I	74.14	N/A	74.28	N/A	74.40	N/A
09COTT00155D	72.48	N/A	72.66	N/A	73.11	N/A
09COTT00152D	72.19	N/A	72.35	N/A	72.91	N/A
09COTT00138bI	70.84	N/A	71.00	N/A	71.17	N/A
09COTT00090J	68.74	N/A	68.91	N/A	69.02	N/A
09COTT00081I	68.63	N/A	68.78	N/A	68.89	N/A
09COTT00039J	65.49	N/A	65.87	N/A	66.25	N/A
09COTT00011J	65.45	1.95	65.85	2.69	66.14	5.08



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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The Office of Public Works
Jonathan Swift Street
Trim
Co Meath

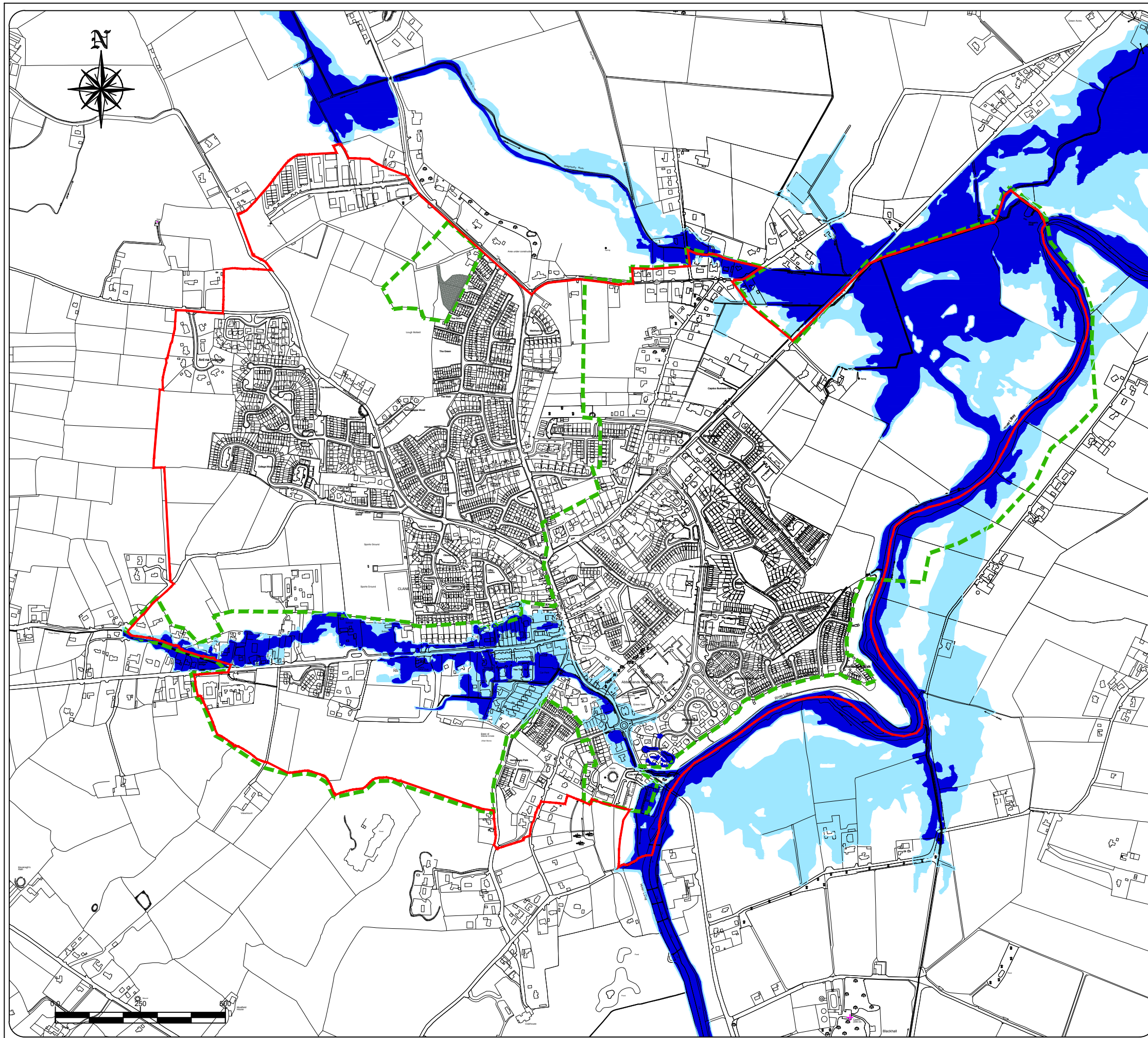
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Map:	
Clane Fluvial Flood Extents	
Map Type: EXTENT	
Source: FLUVIAL	
Map Area: HPW	
Scenario: CURRENT	
Drawn By: C.C.	Date: 28 July 2016
Checked By: M.W.	Date: 28 July 2016
Approved By: S.P.	Date: 28 July 2016
Drawing No.:	
E09CLA_EXFCD_F0_09	
Map Series: Page 9 of 13	
Drawing Scale: 1:5,000 @A3	





**APPENDIX B CLANE LOCAL AREA PLAN 2017-2023, MAP 8.1
(AREAS FOR WHICH SITE-SPECIFIC FLOOD RISK ASSESSMENT IS REQUIRED)**




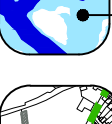

Kildare County Council
 Planning Department
 Áras Chill Dara,
 Devoy Park, Naas,
 Co Kildare.

Clane Local Area Plan 2017 - 2023

Legend

-  Local Area Plan Boundary
-  Development proposals for lands outlined thus are to be the subject of site-specific Flood Risk Assessment in accordance with the Flood Risk Management Guidelines and appropriate to the type and scale of the development being proposed.

- Such Development Proposals shall also:
- Indicate and quantify loss of floodplain storage arising from the development proposal;
 - Provide compensatory storage located within or adjacent to the proposed development;
 - Indicate measures to ensure that water-vulnerable elements of the Development would not be flooded during the 1000year flood;
 - Ensure that existing flow paths for flood waters will not be compromised.

-  Flood Risk Zone A (1.0% AEP)
-  Flood Risk Zone B (0.1% AEP)
-  Pluvial Flood Risk Zone

Source:



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Strategic Flood Risk Assessment Recommendations

Scale: N.T.S.	Map Ref.: 9.1
Date: June 2017 (Adopted LAP)	Drawing No.: 200/16/1000
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This drawing is to be read in conjunction with the written statement