MALONE O'REGAN
CONSULTING ENGINEERS

PROPOSED PART 8 RESIDENTIAL DEVELOPMENT

COOLAGHKNOCK GLEBE, KILDARE.

DESKTOP FLOOD RISK ASSESSMENT

KILDARE COUNTY COUNCIL

May 2024

Project No: 23006

Contents Amendment Record

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Title: **Proposed Part 8 Residential Development – Coolaghknock Glebe, Kildare Desktop Flood Risk Assessment / Kildare County Council**

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0	14.07.23	Initial Issue	P1	AB	PB	PB
1	19.10.23	LAP amendments	P1	KA	PB	PB
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2	08.04.24	Pre-Planning	P1	KA	DW	PB
3	17.05.24	Planning	P3	KA	DW	DW

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1 INTRODUCTION

This report is prepared on behalf of the NDFA and Kildare County Council to accompany a Part 8 proposal for the residential development on a site with access off Connagh Road, south of Melitta Road in the townland of Coolaghknock Glebe, Kildare, Co. Kildare.

The proposed development includes:

i. 131 no. residential units including 89 no. houses and 42 no. own door apartment / duplex units to be delivered on a phased basis, comprising 42 no. one bed units; 36 no. two bed units; 45 no. three bed units; and 8 no. four bed units; with renewable energy design measures (which may be provided externally) for each housing unit;
ii. Rear garden sheds serving the residential units;
iii. 1 no. crèche facility of 325sqm with potential for community use until such time as crèche becomes viable;
iv. Landscaping works including provision of (a) open space and kick about areas; (b) natural play features; (c) new pedestrian and cycle connections; and (d) attenuation pond;
v. Associated site and infrastructural works, including provision for (a) 2 no. ESB substations and switchrooms; (b) car and bicycle parking; (d) public lighting; (e) bin storage; (f) temporary construction signage; (g) estate signage; and (h) varied site boundary treatment comprising walls and fencing; and
vi. all associated site development works.

The purpose of this Desktop Flood Risk Assessment (DFRA) is to assess the potential flood risk to the proposed development site and to assess the impact that the development as proposed may or may not have on the hydrological regime of the area.

Quoted ground levels or estimated finished floor levels relate to Ordnance Datum (Malin) unless stated otherwise.

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 study was principally focused on examining flooding risks to the proposed site from the Tully Stream. Additionally, the impacts from pluvial flooding risks have been reviewed for the site.

2 PROPOSED SITE DESCRIPTION

2.1 Site Description

The location of the proposed development is illustrated in Figure 2.1 below. The site is situated on the outskirts of Kildare town, approximately 1km to the east of the town centre. The new residential development is located beside existing housing estates Curragh Plains and Coolaghknock Drive to the west of the site. The site is accessed via Connagh Road which serves an existing housing development to the northwest and connects with R413 Melitta Road. The site is bound to the south by undeveloped greenfield sites. The R445 Dublin Road is located 650m to the south.

The lands to the east of the site remain largely undeveloped, greenfield sites with some isolated housing leading 0.75km to the Curragh Racecourse lands. Some of these lands are used for agricultural purposes and stables.

Figure 2.1 – Site Location with Indicative Site Boundary and Adjacent Developments

2.2 Surrounding Watercourses

There are no hydrological features within the near vicinity of the site. The nearest water source is the Tully Stream. The site is 4 km north of Tully Stream, which flows south into the River Barrow. The River Barrow course flows south into Waterford Harbour.

Figure 2.2 – Surrounding Watercourse
(Extract from the EPA Maps)

2.3 Land Use Zoning

Land use zoning map is used in order to assess which types of developments, based on vulnerability to flood risk, are appropriate for each Flood Zones.

Where developments/land uses are proposed that are considered inappropriate to the Flood Zone that may be identified in the future at project level following adoption of the Plan, then a Development Management Justification Test and site-specific Flood Risk

Assessment will be required in accordance with The Planning System and Flood Risk Management Guidelines 2009 (and as updated).

Vulnerability Class	Land Use and Types of Development which include
Highly vulnerable development (including essential infrastructure)	Garda, ambulance and fire stations and command centres required to be operational during flooding; Hospitals; Emergency access and egress points; Schools; Dwelling houses, student halls of residence and hostels; Residential institutions such as residential care homes, children's homes and social services homes; Caravans and mobile home parks; Dwelling houses designed, constructed or adapted for the elderly or other people with impaired mobility; and 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.
Less vulnerable Development	Buildings used for: retail, leisure, warehousing, commercial, industrial and non-residential institutions; Land and buildings used for holiday or short-let caravans and camping, subject to specific warning and evacuation plans; Land and buildings used for agriculture and forestry; Waste treatment (except landfill and hazardous waste); Mineral working and processing; and Local transport infrastructure
Water compatible development	Flood control infrastructure; Docks, marinas and wharves; Navigation facilities; Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location; Water-based recreation and tourism (excluding sleeping accommodation); Lifeguard and coastguard stations; Amenity open space, outdoor sports and recreation and essential facilities such as changing rooms; and Essential ancillary sleeping or residential accommodation for staff required by uses in this category (subject to a specific warning and evacuation plan).

Table 2.1 - Matrix of Vulnerability vs. Flood Zone
(Extract from the Strategic Flood Risk Assessment of the Kildare County Development Plan 2023-2029)

Refer to Flood Risk Management Guidelines 2009 and 'Strategic Flood Risk Assessment for the Kildare CDP 2023-2029 for additional details:

- Highly vulnerable developments include houses, schools, hospitals, residential institutions, emergency services, essential infrastructure, etc.
- Less vulnerable developments include economic uses (retail, leisure, warehousing, commercial, industrial, non-residential institutions, etc.), land and buildings used for agriculture or forestry, local transport infrastructure, etc.

Land use zone map of the Kildare Town Local Area plan 2023-2029 outlines that the proposed development is located within land zoned as *"Phase 2 New Residential."* An extract can be found in Figure 2.3 below. For full map refer to Appendix A.

The land to the north and west of the site is zoned as *"Existing Residential."* The land to the east is zoned as *"National Stud and Green Belt."*

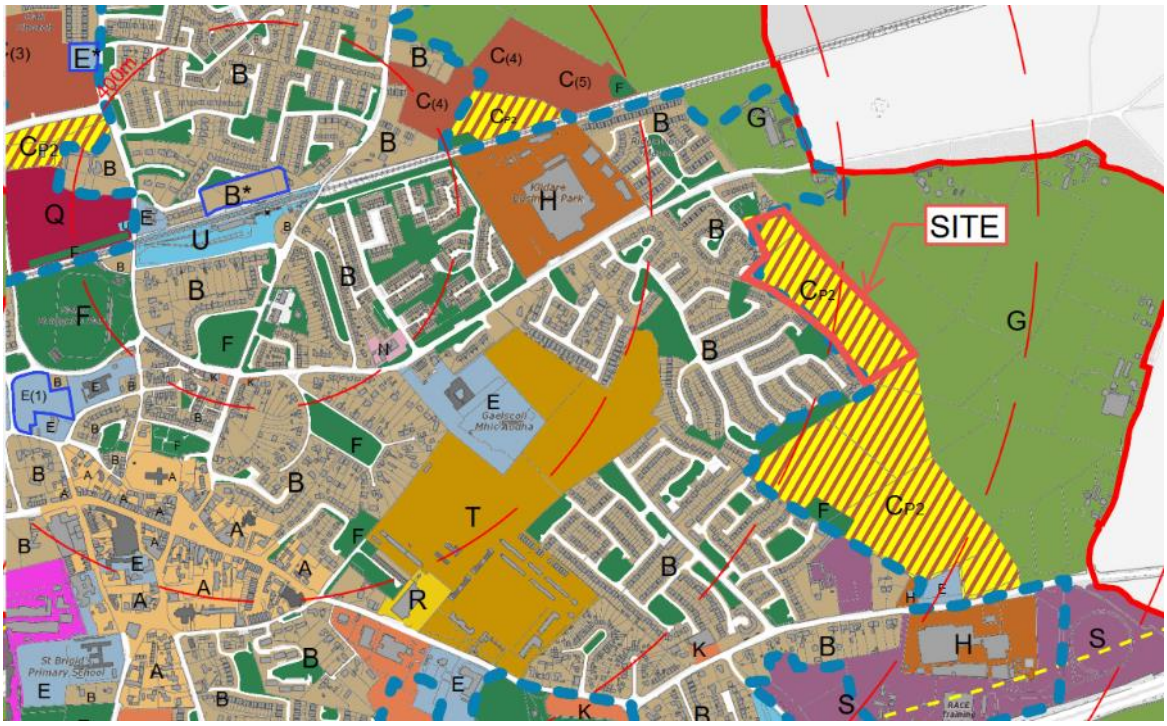


Figure 2.3 – Land Use Zoning Map (Extract from KCC PPP Bundle 5 Design Brief)

2.4 Existing Topography Levels at Site

A topographical survey of the site shows site general slopes upward from south to north from +96.61m to +103.47m. The steepest changes in elevation occur in the southwestern and northwestern corners with most of the site being between +100.5m to +101.5m

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
- Climate Change
- OPW Flood Records from www.floodmaps.ie
- Ordnance Survey Historic Mapping
- Strategic Flood Risk Assessment, Kildare County Development Plan 2023-2029

3.1 The National Preliminary Flood Risk Assessment

The National Preliminary Flood Risk Assessment (PFRA), which was carried out by the OPW in March 2012, identified Areas of Further Assessment (AFA) where further, more detailed assessment was required to determine the degree of flood risk. Flood Risk Assessment Maps were prepared by the Catchment Flood Risk Assessment and Management (CFRAM) Study which indicate the extent of flooding caused by fluvial flood events with an annual exceedance probability (AEP) of 10% (10yr event), 1% (100yr event) and 0.1% (1000yr event) in these areas. The final versions of the maps were published in May 2017.

The CFRAM maps indicating 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) are included in Appendix B.

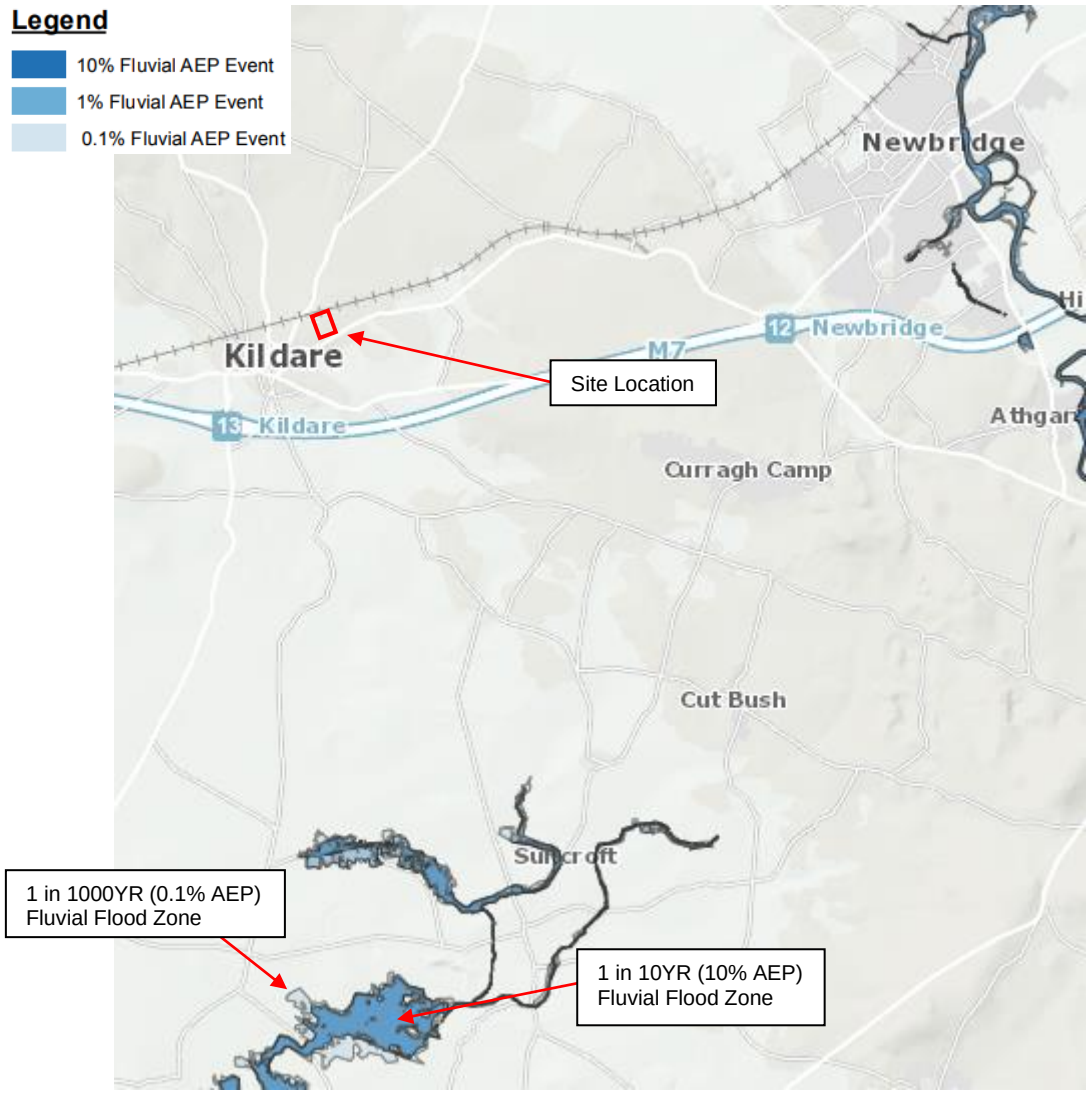


Figure 3.1 – CFRAM Fluvial Flood Extent Map (Extract from OPW)

The PFRA flood mapping indicates that the proposed development site does not fall within any current fluvial flood zones. The site is not located near any major open watercourse.

The CFRAMS flood map also provides information on predicted water levels for the 10% AEP (1 in 10 year), 1% AEP (1 in 100 year) and 0.1% AEP (1 in 1000 year) fluvial flood events at various node points along the Tully Stream. The node points are listed in Table 3.1 below. The location of the node points are indicated in Figure 3.2 and on the drawings in Appendix B. Predictive extreme flood levels at the node point closest to the site are applicable to utilise in the assessment of potential fluvial flood risk to the proposed development site.

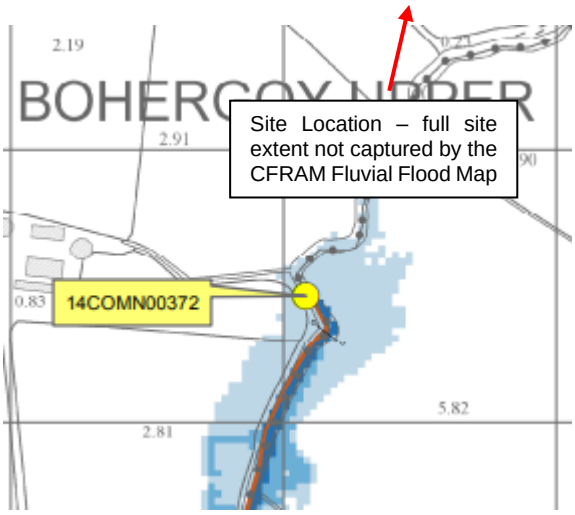


Figure 3.2 – Extract from PFRA Maps (Extract from OPW)

Node Label	Water Level 10% AEP	Water Level 1% AEP	Water Level 0.1% AEP
14COMN00372	**87.1**	**87.37**	**87.61**
14COMN00351	86.2	86.38	86.54
14COMN00299	84.3	84.51	84.60
14COMN00281	83.9	84.12	84.26
14COMN00239E	83.0	83.29	83.51

Table 3.1 – CFRAMS Predicted Water Levels

According to the Strategic Flood Risk Assessment (SFRA) of the Kildare Town Local Area Plan 2023 – 2029 the recommended minimum finished floor level is to be:

Scenario	Finished floor level to be based on
Fluvial, undefended	1% AEP flood + climate change (20% allowance for highly vulnerable development) + 500mm freeboard

Table 3.2 – Recommended Minimum Finished Floor Levels
(Extract from the Strategic Flood Risk Assessment of the Kildare County Development Plan 2023-2029)

The node point closest to the proposed development site is referenced as node point 14COMN00372 The 1% AEP (1 in 100 year) and 0.1% AEP (1 in 1000 year) flood levels at this point are predicted as 87.37m OD and 87.61m OD respectively.

When reviewing these levels, consideration needs to be given to the potential impact of climate change, resulting in increased quantities of rainfall. The Planning System and Flood Risk Management Guidelines for Planning Authorities DOEHLG 2009 Technical Appendix A, Section 1.6 recommends that, where mathematical models are not available

climate change flood extents can be assessed by using the Flood Zone B outline as a surrogate for Flood Zone A with allowance for the possible impacts of climate change. Therefore, the predicted 0.1% AEP flood level listed in above (87.61m OD) is considered to be representative of the 1% AEP (1 in 100 year) mid-range future climate change scenario.

Using the information obtained from the predicted flood level, in order to permit a sustainable development of this site and to mitigate against potential residual flood risk to the development it is recommended that the finished floor level for all units should be above a minimum level of 87.61+500mm freeboard = 88.11m OD. The minimum proposed finished floor level is 98.15m OD which is significantly higher than the required minimum finished floor level.

There is a gauge datum located in Tully Stream near the Kildare Town area. The datum reads a water level of 83.24m. This is lower than the minimum finished floor level, further assuring flooding will not be of concern.

3.2 OPW Flood Records

The OPW Flood Maps Website (www.floodinfo.ie) was consulted in relation to available historical or anecdotal information on any flooding incidences or occurrences in the vicinity of the proposed development site. These records, which are summarised in Appendix C of this report, indicate 1 recorded flood event within a 2.5km radius of the proposed site.

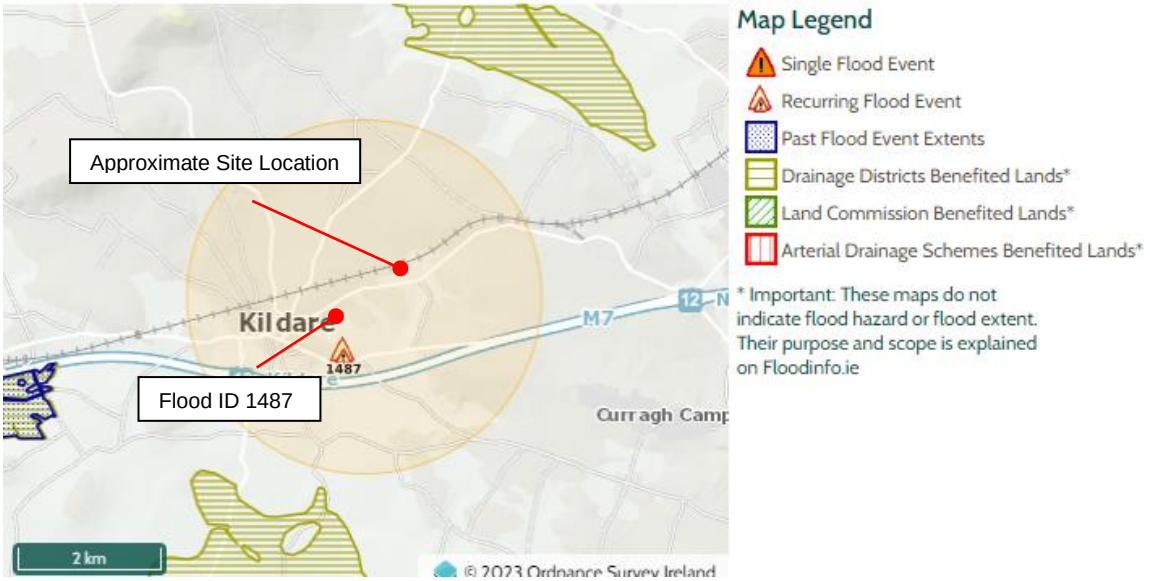


Figure 3.3 – OPW Flood Event Summary

Figure 3.3 indicates various historical flooding events within Kildare town Area. There is only one recorded recurring instance of flooding in this area of Kildare town. The Flood Event (ID 1487) occurs because the surface water from Kildare town is piped to the location

to prevent flooding in the town. This flood location is approximately 900m from the subject site and does not reflect a flood risk to the development.

Based on available and recorded information as outlined above, the development site is considered not to have been subject to flooding in recent history.

3.3 Ordnance Survey Historic Mapping

Historic Groundwater Flood Maps were produced by Geological Survey Ireland. The historic groundwater flood map is a national-scale flood map presenting the maximum historic observed extent of karst groundwater flooding. The map is primarily based on the winter 2015/2016 flood event, which in most areas represented the largest groundwater flood event on record. The map was produced based on the SAR imagery of the 2015/2016 event as well as any available supplementary evidence. The floods were classified by flood type differentiating between floods dominated by groundwater (GW) and floods with significant contribution of groundwater and surface water (GWSW).

The map that was viewed was the historical 6-inch map (pre-1900). Figure 3.4 below illustrate the historic mapping for the area of the proposed development site.

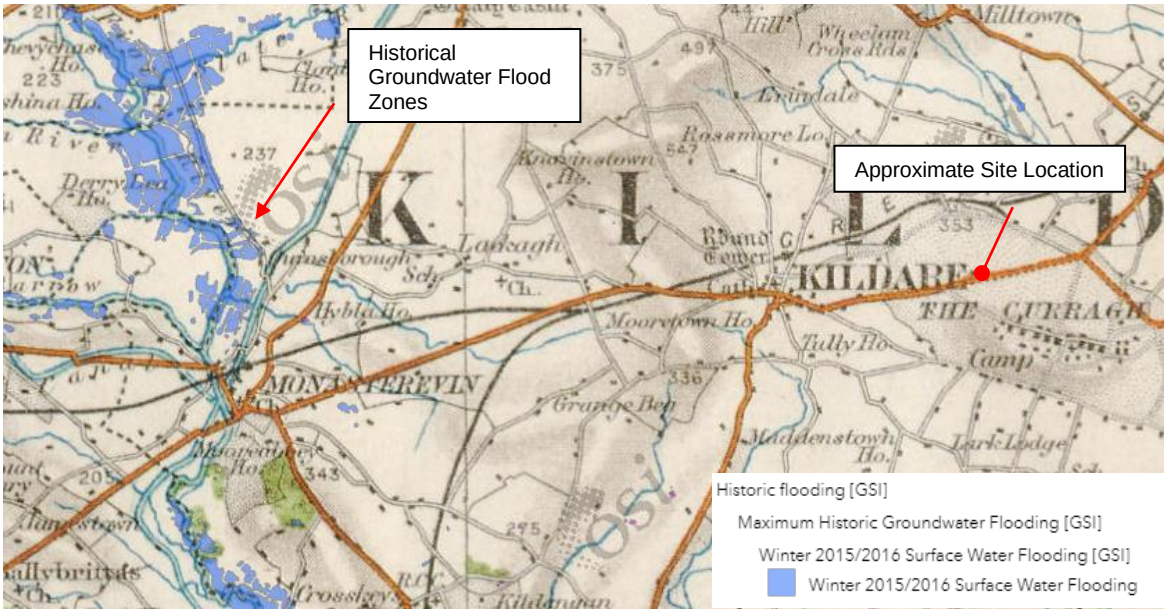


Figure 3.4 – Historic 6 Inch Mapping

The historic 6-inch mapping does not indicate any historical or anecdotal instances of flooding within or adjacent to the boundary of the proposed development site. The nearst groundwater flood zone is 4.5km away and is not considered relevant ot the subject site.

3.4 Strategic Flood Risk Assessment, Kildare County Development Plan (2023-2029)

The Kildare Town Local Area Plan Strategic Flood Risk Assessment (2023 – 2029) was prepared and informed by 'The Planning System and Flood Risk Management – Guidelines for Planning Authorities' (2009). The purpose of the SFRA was to provide an assessment of all types of flood risk to inform land-use planning decisions in the Kildare County Development Plan. To help inform planning decisions flood maps were generated, which are illustrated in Figure 3.5 below. This map was developed utilising the CFRAMS flood mapping (illustrated in Figure 3.1 above). The predictive flood map illustrates that "there is no hydraulic connection between the floodplains mapped within the National Indicative Flood Mapping Study and the Kildare Town LAP area.

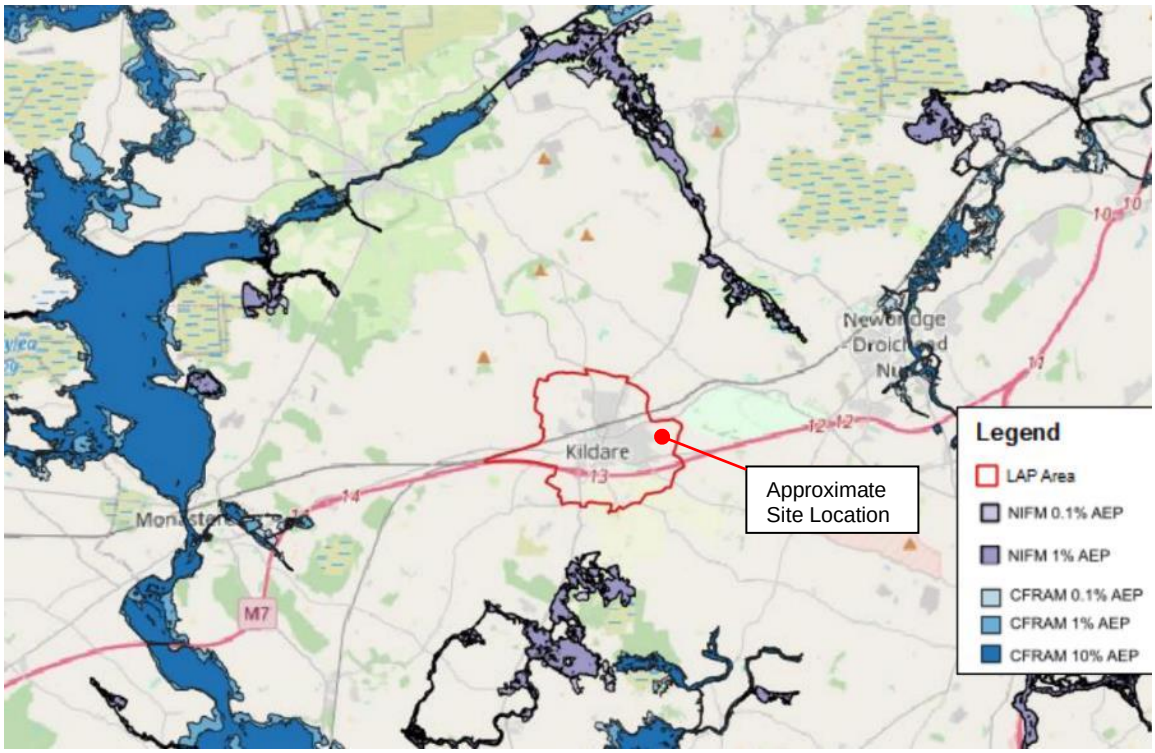


Figure 3.5 – Predictive Flood Mapping (Source: Kildare Town SFRA 2023- 2029)

4 PLUVIAL FLOOD RISK ASSESSMENT

The Kildare Town Local Area Plan Strategic Flood Risk Assessment (2023 – 2029) identifies several areas which are at risk of pluvial flooding. The SFRA, along with the topographical survey and a walkover of the site and surrounding area, were used to assess the potential risk to the proposed development as a result of pluvial flooding.

Figure 4.1 shows an extract from the SFRA identifying areas with reported infiltration capacity issues in nearby soakaways. Some soakaways lack capacity resulting in overland flow when full. These included the soakaways and holding tanks servicing the Maryville, Beechgrove, Dara Park and Melitta Park residential estates. Melitta Park being the closest to the site, approximately 480m to the west of the site. The proposed site is not reported to have infiltration capacity issues.

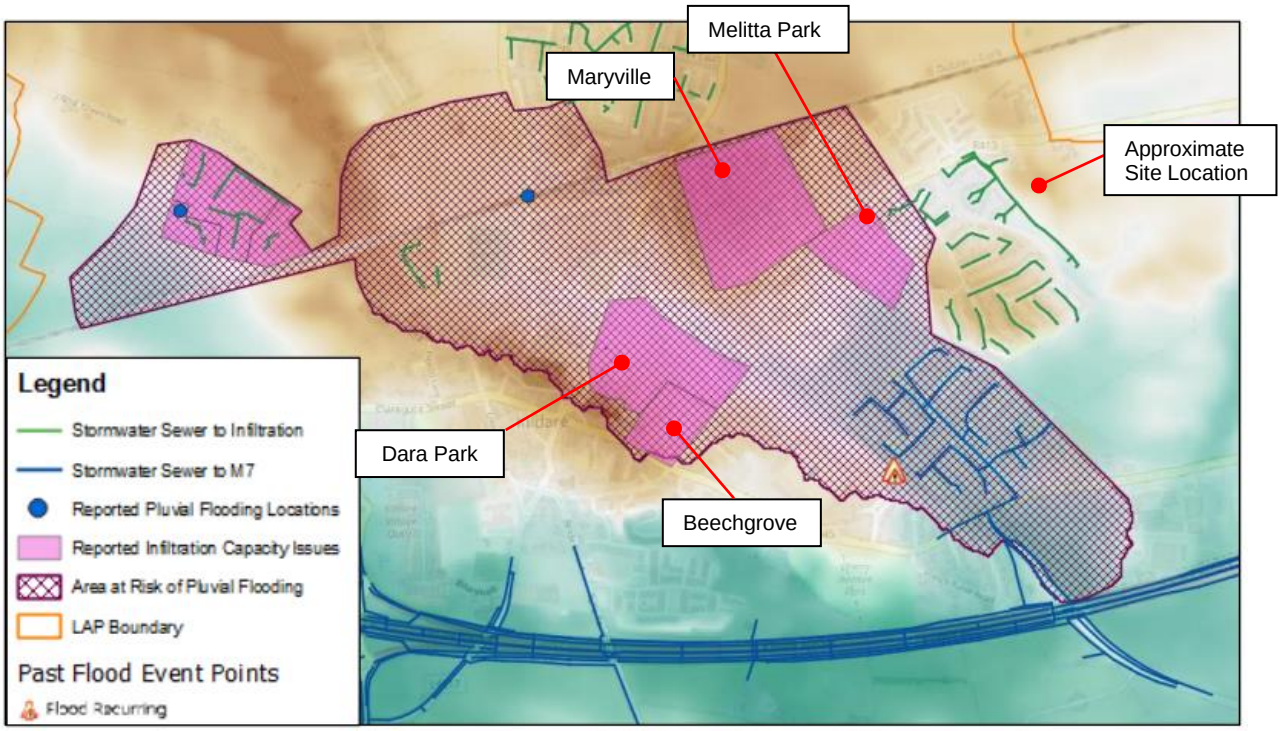


Figure 4.1 – Areas with Reported Infiltration Capacity Issues (Source: Kildare Town SFRA 2023- 2029)

The Strategic Flood Risk Assessment which accompanies the Kildare Town Local Area Plan (LAP) 2023-2029 indicates that the subject site is prone to pluvial flooding. The areas which are prone to flooding are indicated in Figure 4.2 below.

Figure 4.2 – Pluvial Flood Risk Assessment (Extract from Kildare Town SFRA Table 6-1)

A topographical survey has been completed on the site which identified 2 no. low-lying areas, the location of which corresponds to the pattern of flooding in Figure 4.2. The low-lying areas identified in the topographical survey are indicated on Malone O'Regan drawing NDFA-SHB5-06-DR-MOR-C-701 and in Figure 4.3.

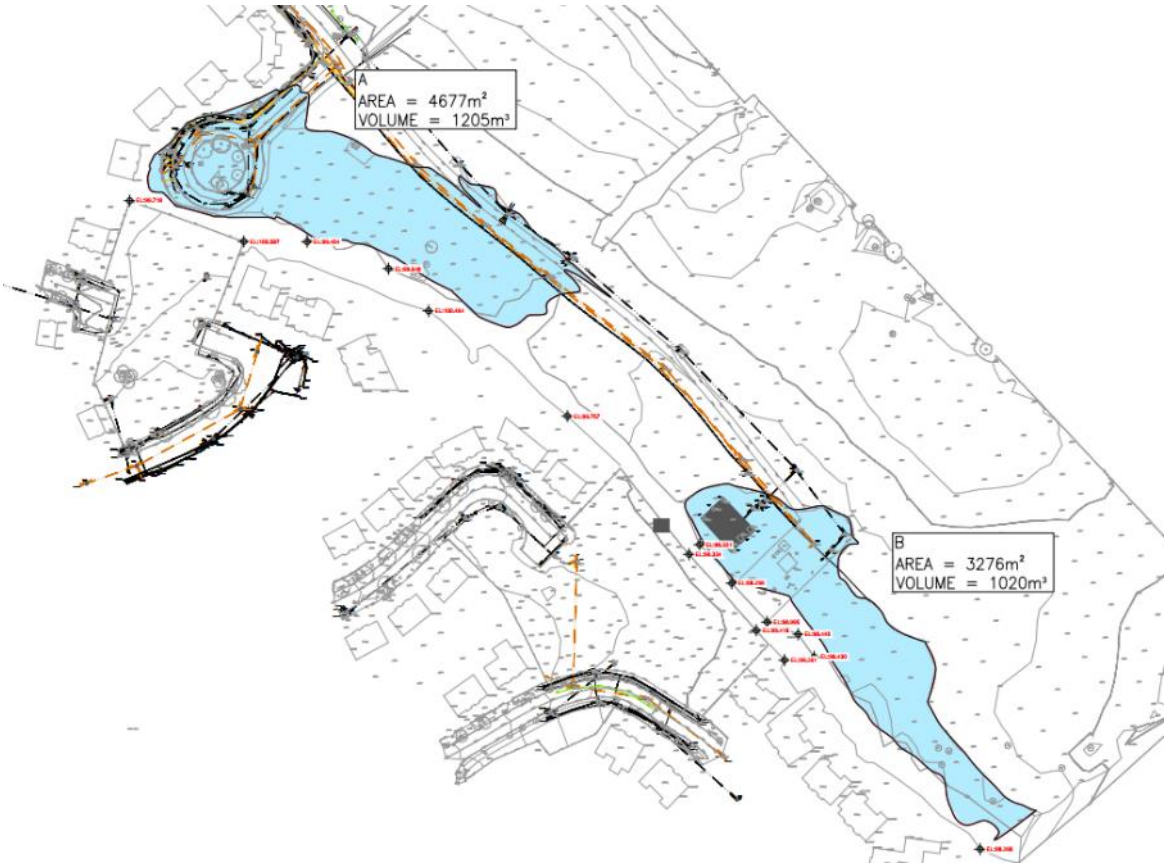


Figure 4.3 – Flood Water Storage Capacity of Existing Site

(Extract from drawing NDFA-SHB5-06-DR-MOR-C-701)

Area A is roughly confined by the +99m contour. When the water level exceeds +99m it will overflow and drain in a south-easterly direction towards Area B. Pond Area B is roughly confined by the +98m contour. Currently, should the level of standing water on the site exceed this level it will discharge onto the adjoining lands to the southeast.

The site layout has been developed considering this pluvial flood risk zone. No dwellings are proposed along this southwestern sedge of the site. The proposed local area creche is proposed within this zone but is considered acceptable given that it is a less vulnerable development when compared against residential housing. The finished floor level of the creche has also been set at 99.75m OD which is 750mm above the maximum pluvial flood level which could occur. As noted above, should pluvial flooding occur above this level, flood water will tend to fall to adjoining lands to the southeast before they would impact on the creche.

The site layout now proposed includes a number of depressed landscaped areas along the southwestern boundary of the site. These low-lying areas have been sized to ensure they can store a volume of pluvial flooding which is at least equal to that offered by the existing site topography.

The volume of water which can be stored on the ground of the existing site is indicated on drawing NDFA-SHB5-06-DR-MOR-C-701. The storage capacity of Area A is 1,205m^3 and

the storage capacity of Area B is 1,020m^3. The combined storage capacity of the existing site is therefore **2,225m^3**.

The proposed layout includes 4 no. low-lying areas will permit the detention and storage of pluvial flooding. These areas are indicated in Figure 4.4 below. The volume of pluvial flooding which could potentially be storaed in each area is outlined below:

Storage Area A = 391m^3

Storage Area B = 367m^3

Storage Area C = 446m^3

Storage Area D = 1056m^3. Note that this volume is measured above the flood level which could potentially occur in the infiltration basin during a 1 in 100-year storm event (+97.649m).

The total storage volume provided by the depressed areas is therefore **2,260m^3**.

The storage capacity of the proposed site therefore exceeds the storage capacity of the existing site.

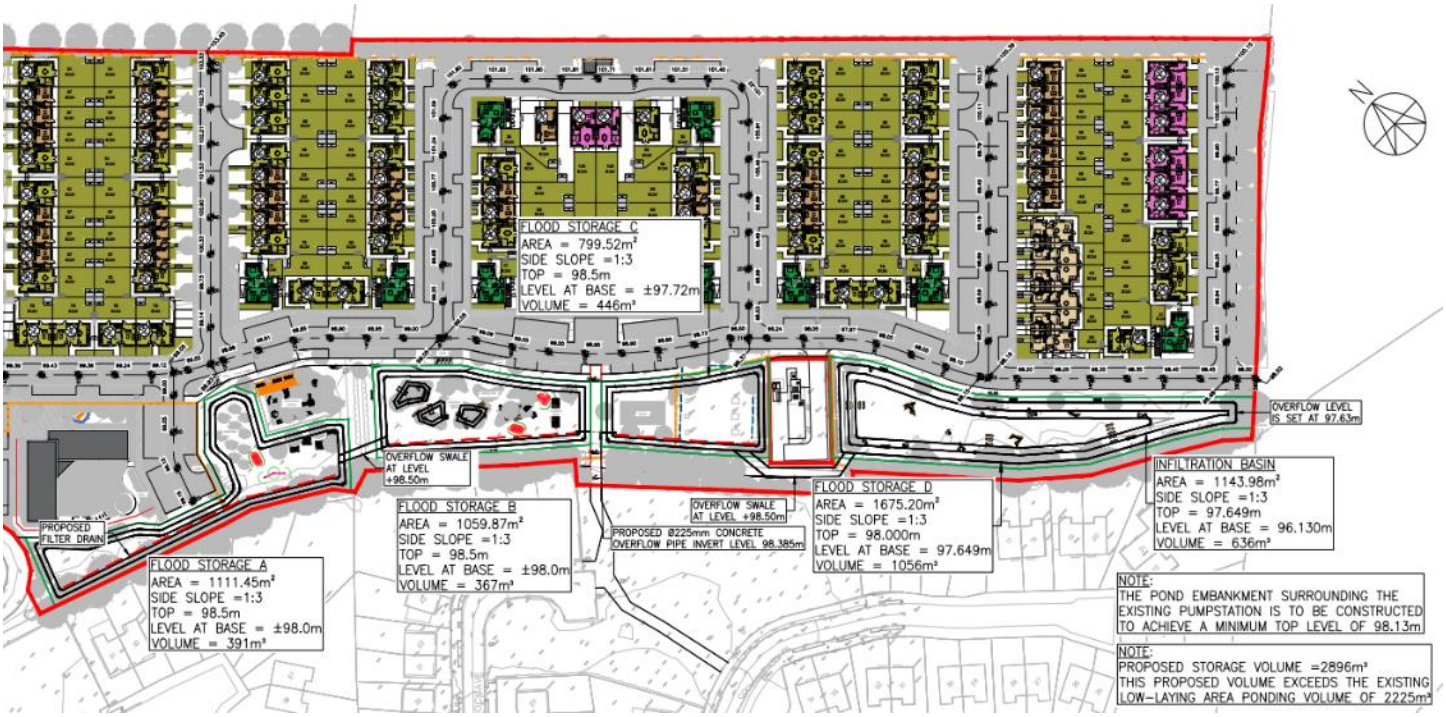


Figure 4.4 – Flood Water Storage Capacity of Proposed Site

(Extract from drawing NDFA-SHB5-06-DR-MOR-C-702)

In order to ensure that the low-lying areas do not become waterlogged, they have been designed so that there is a gentle drop in levels towards the southwestern boundary. It is proposed to provide a filter drain along the southwestern edge of each depressed area to allow water to percolate into the sub-soil. A number of soakaway tests have been conducted on the site which indicate that good percolation rates can be achieved. This is

discussed in further detail in Malone O'Regan's 'Engineering Report'; which is provided under separate cover.

5 SURFACE WATER DRAINAGE CORRIDOR

According to the Kildare Town Local Area Plan 2023-2029 a new surface water drainage corridor route is to be allowed for on the development site, see Figure 5.1 below. This corridor will allow surface water to be conveyed towards potential nature-based management areas (NBMAs), for example ponds, infiltration systems and bioretention areas. These represent opportunities to build additional surface water attenuation capacity into the catchment.

Malone O'Regan drawing no. SHB5-CGK-DR-MOR-CS-P3-702 indicates how this corridor can be accommodated within the proposed site layout. An extract from this drawing is provided in Figure 5.2 below for reference.

The overflow from this future surface water corridor can be routed to the southern end of the site and directed towards the southwest drainage plans for sub-catchment 03.

In order to cater for the intervening period, prior to this surface water drainage corridor being provided, the proposed layout has been designed with a number of low-lying areas along the southwestern boundary of the site. These areas which are denoted as Flood Storage A, B, C and D on drawing SHB5-CGK-DR-MOR-CS-P3-702 ensure that the site has adequate capacity to cater for pluvial flood events, storing rainwater on site and ensuring that there is no increase of water being displaced onto adjoining lands. Refer to further details in Section 4 of this report.

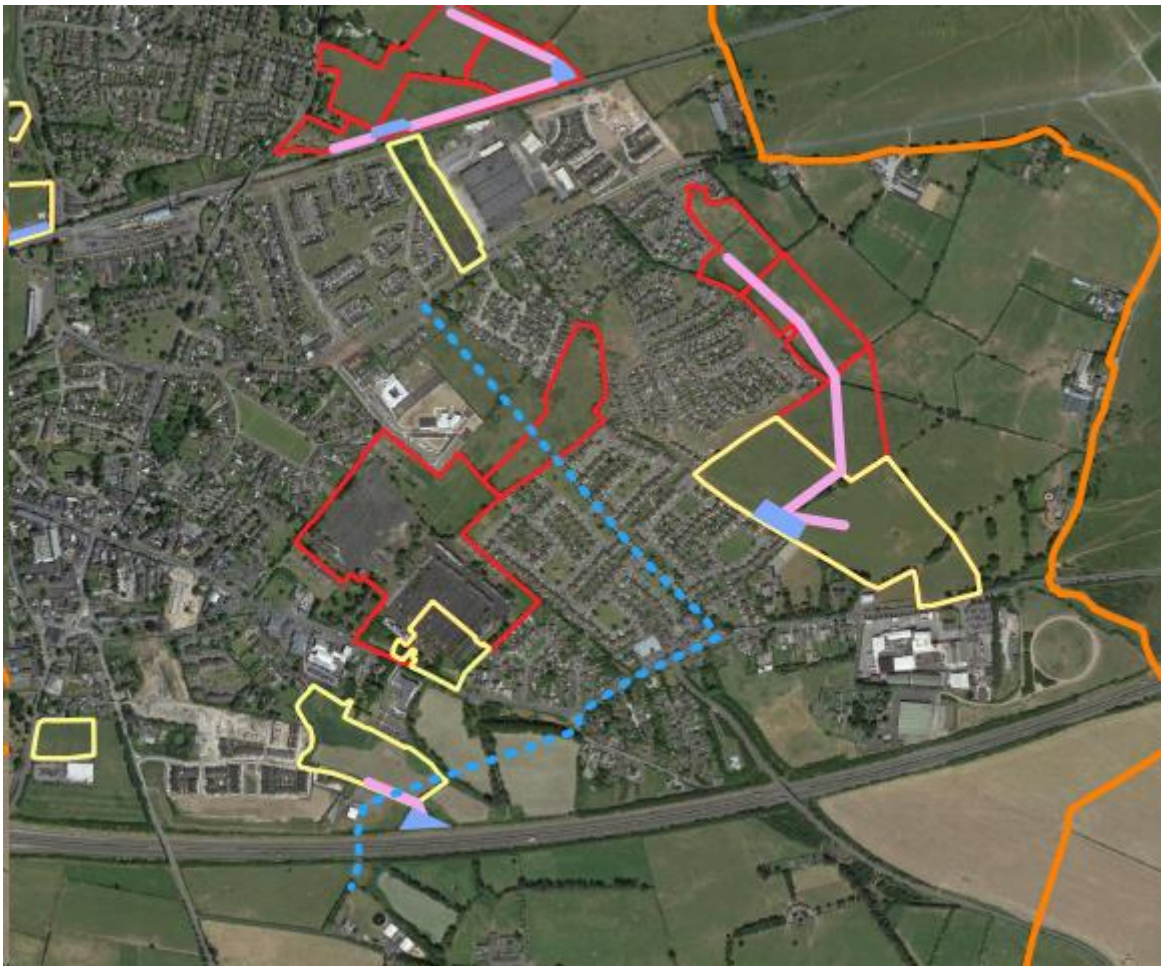


Figure 5.1 SW Drainage Corridor (Source – Kildare Town Surface Water Study Stage 2 - Surface Water Management Proposals Appendix A)

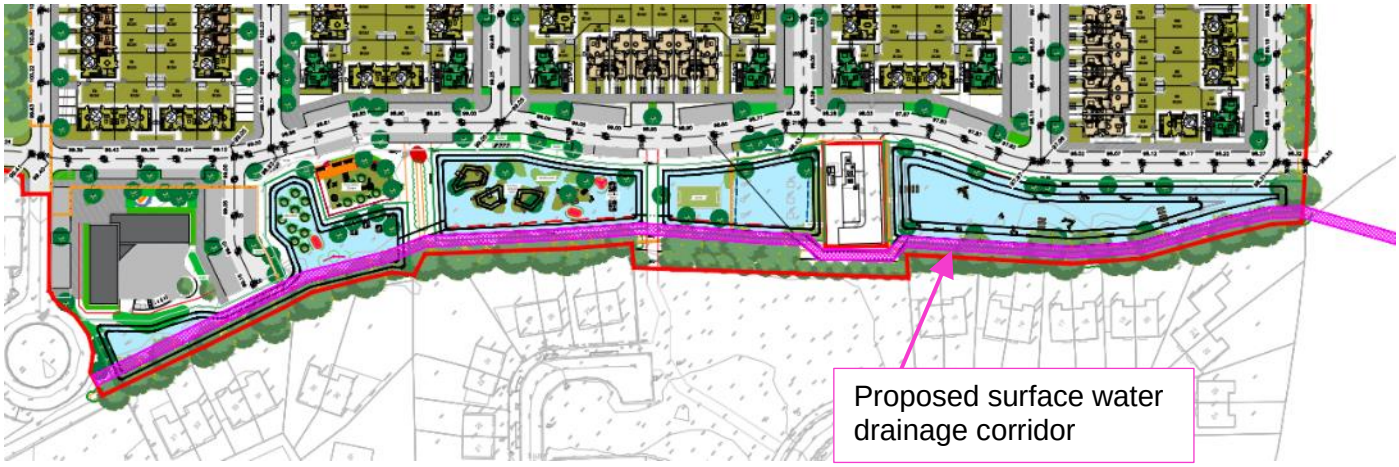


Figure 5.2 Proposed Indicative Route for Future SW Drainage Corridor (extract from drawing SHB5-CGK-DR-MOR-CS-P3-702)

6 OTHER FLOOD SOURCES

Given the subject site's inland location and relative position to rivers it is not on any tidal flood plain.

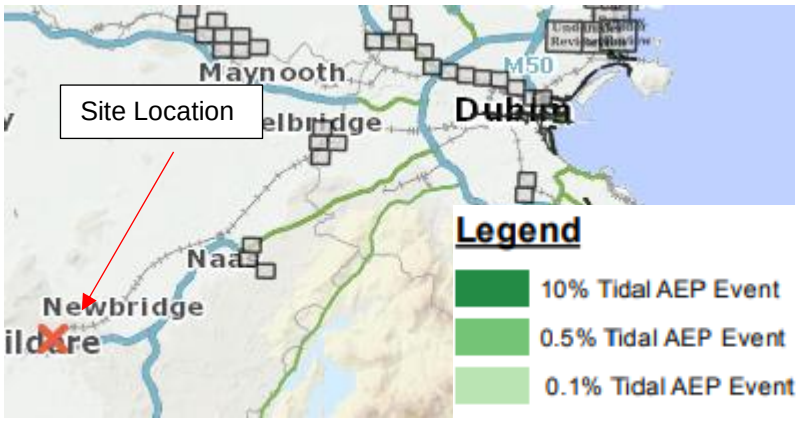


Figure 6.1 – CFRAM Tidal Flood Extent Map
(Extract from OPW)

7 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 7.1 below.

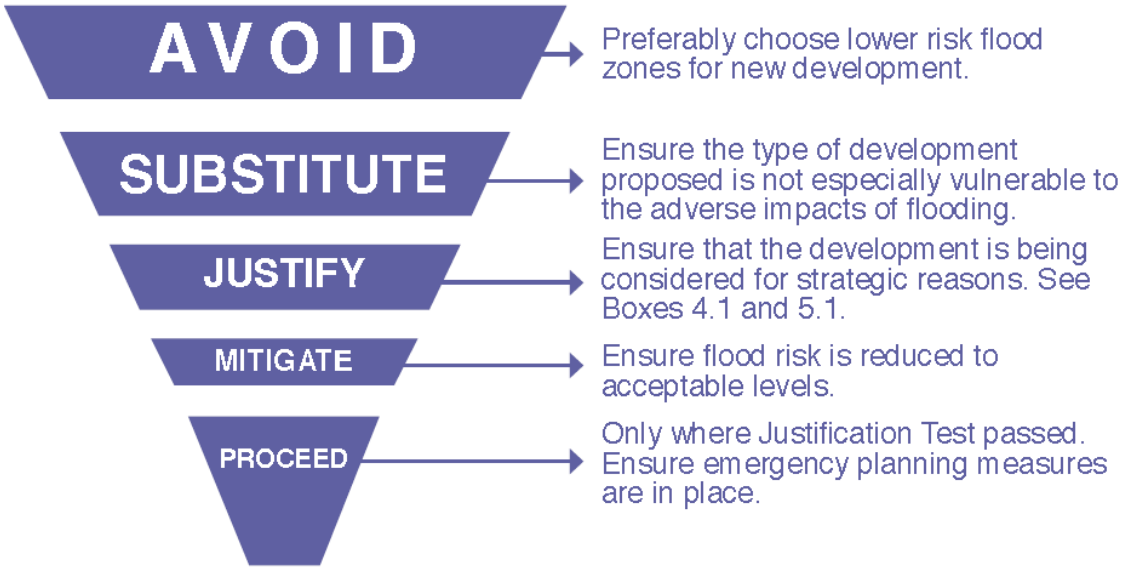


Figure 7.1 Source: The Planning Systems and Flood Risk Management: Guidelines for Planning Authorities November 2009

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.

7.1 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 coastal flooding.

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 and Section 4, the proposed development is outside of the area predicted to flood during a 0.1% AEP (1 in 1000year) fluvial flood event. The development is therefore located within Flood Zone C in accordance with the 2009 Planning Guidelines.

7.2 Vulnerability Class of Proposed Development

The vulnerability class of the development is dependent on the land use and type of development proposed. See Table 7.1 for the vulnerability classes.

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

Table 7.1 - 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 7.2. Based on the land uses listed in Table 4, the proposed residential development is classified as a highly vulnerable development. 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 7.2 - Matrix of Vulnerability vs. Flood Zone
(Source – Table 3.1 Planning System and Flood Risk Management – Guidelines for Planning Authorities DEHLG, OPW, November 2009)

8 SUMMARY AND CONCLUSIONS

The analysis and flood zone delineation undertaken as part of this DFRA indicates that the proposed site is not expected to be impacted during the occurrence of a 0.1% AEP (1 in 1000 year) fluvial flood event.

The PFRA flood mapping indicates that the proposed development site does not fall within the predicted extreme 0.1% (1 in 1000 year) current scenario fluvial flood zone. The site is not located near any major open watercourse.

According to the SFRA of the Kildare County Development Plan 2023 – 2029, it is recommended that for a scenario of fluvial event-undefended, the minimum finished floor level is to be based on 1% AEP flood + climate change (20% allowance for highly vulnerable development) + 500mm freeboard.

The Planning System and Flood Risk Management Guidelines for Planning Authorities DOEHLG 2009 Technical Appendix A, Section 1.6 recommends that, where mathematical models are not available climate change flood extents can be assessed by using the Flood Zone B outline as a surrogate for Flood Zone A with allowance for the possible impacts of climate change. Therefore, the predicted 0.1% AEP flood level (87.61m OD) is considered

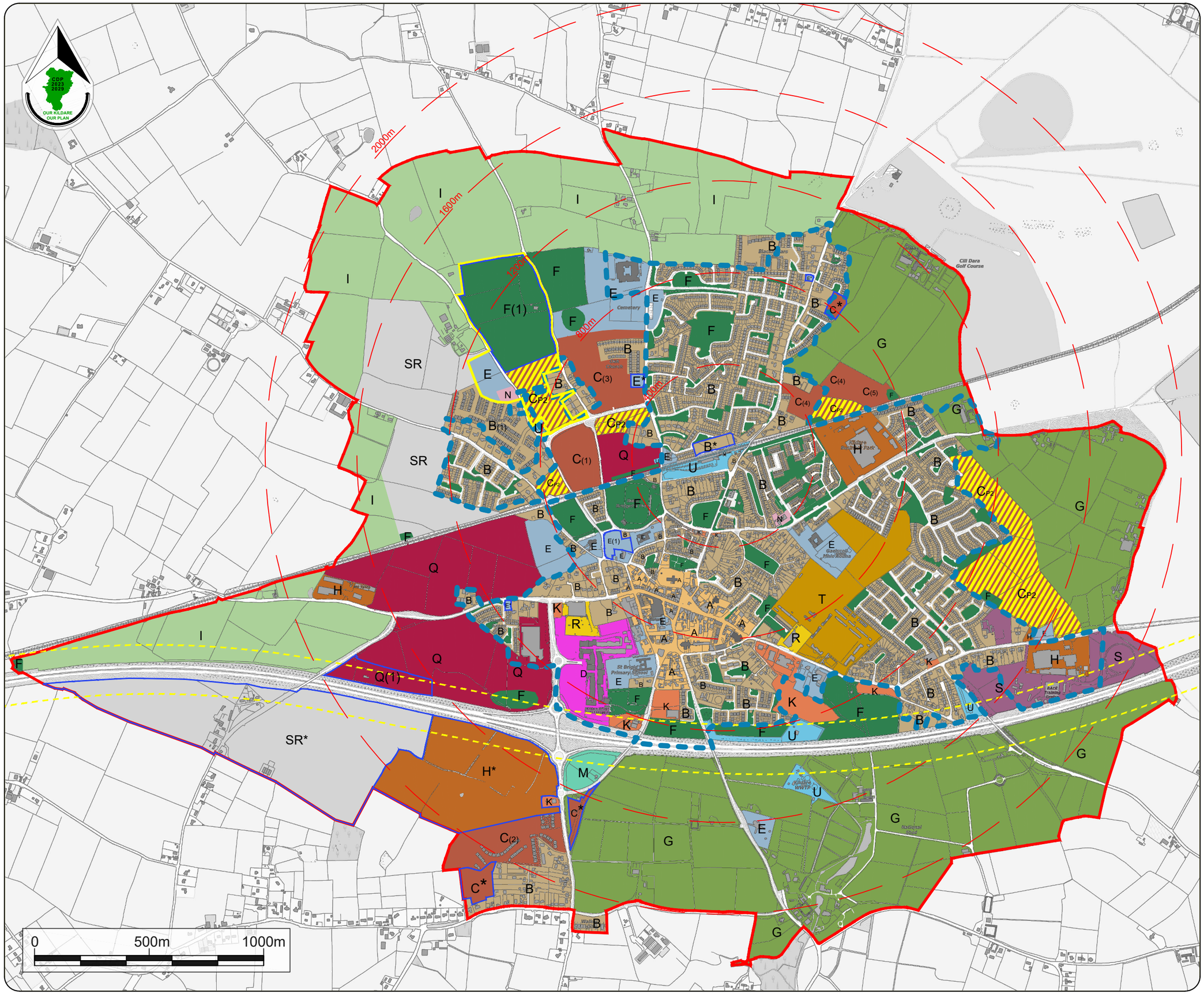
to be representative of the 1% AEP (1 in 100 year) mid-range future climate change scenario.

Using the information obtained from the predicted flood level, in order to permit a sustainable development of this site and to mitigate against potential residual flood risk to the development it is recommended that the finished floor level for all units should be above a minimum level of 87.61+500mm freeboard = 88.11m OD. The minimum proposed finished floor level is 98.15m OD which is significantly higher than the required minimum.

In terms of pluvial flood risk, the Kildare Town Local Area Plan Strategic Flood Risk Assessment (2023-2029) identifies a potential pluvial flood zone on the site. A topographical survey and site walkover confirmed two low-lying areas which correspond with the areas identified in the SFRA as being prone to flooding. The site design mitigates the risk of flooding to the proposed buildings by excluding dwellings from these zones and placing the creche at a raised level (99.75m OD) to avoid flood impact. The proposed layout avoids increasing flood risk to neighbouring lands through the inclusion of 4 no. low-lying areas. These areas have a combined storage capacity of 2,260m³ which exceeds the current site storage capacity of 2,225m³. Filter drains are proposed to prevent waterlogging by ensuring proper percolation.

A new surface water drainage corridor has been allowed for in accordance with the Kildare Town Local Area Plan. This future corridor will direct water to nature-based management areas located external to the site. The low-lying areas described above will act as an interim measure until such time as the corridor is provided, storing floodwater and preventing displacement of additional water to adjacent lands. This design aligns with drainage plans for the region, ensuring adequate flood management until the corridor is operational.

APPENDIX A – LAND USE ZONING MAP



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

Kildare Town
Local Area Plan 2023 - 2029

Legend :

- Local Area Plan Boundary
- CSO Built Up Area 2022 Boundary
- Southgreen Key Development Area Boundary
- Site Specific Objective Boundary
- A: Town Centre
- B: Existing Residential / Infill
- C: New Residential
- C: Phase 2 New Residential
- D: Retail Outlet Centre
- E: Community and Education
- F: Open Space and Amenity
- G: National Stud and Green Belt
- H: Industry and Warehousing
- I: Agriculture
- K: Commercial
- M: Tourism
- N: Neighbourhood Centre
- Q: Enterprise and Employment
- R: Retail / Commercial
- S: Equine Industry
- SR: Strategic Reserve
- T: Mixed Use
- U: Transport and Utilities
- 400m intervals from the train station
- 91m line of setback of development from M7 Motorway

Stage	Date	Description
Kildare Town Local Area Plan	06/12/2023	Date the Plan comes into effect
Kildare Town Local Area Plan	26/10/2023	Plan adopted by Elected Members

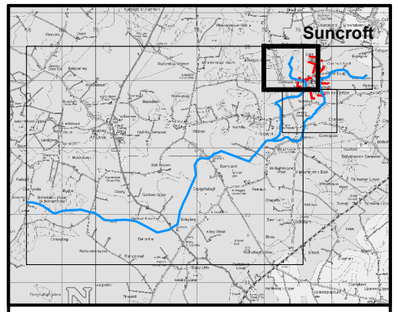
Land Use Zoning

Scale: N.T.S.		Map Ref.: 11.1	
Date: October 2023		Drawing No.: 200/23/1395	
	Drawn by: D Dolan Date: 26/10/2023	Checked by: L Crawford Date: 26/10/2023	Approved by: J O'Reilly Date: 26/10/2023

This drawing is to be read in conjunction with the written statement

APPENDIX B – CFRAM FLUVIAL FLOOD EXTENTS MAP

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
14COMN00372	87.1	3.02	87.37	5.57	87.61	10.33
14COMN00351	86.2	N/A	86.38	N/A	86.54	N/A
14COMN00299	84.3	N/A	84.51	N/A	84.60	N/A
14COMN00281	83.9	3.42	84.12	6.21	84.26	8.21
14COMN00239E	83.0	2.82	83.29	8.56	83.51	17.57



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:
01	Amendments to Flood Extents.	13/12/16

SOUTH EASTERN CFRAM STUDY
CATCHMENT FLOOD RISK ASSESSMENT AND MANAGEMENT

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Map:
Suncroft Fluvial Flood Extents

Map Type:	EXTENT		
Source:	FLUVIAL		
Map Area:	HPW		
Scenario:	CURRENT		
Drawn By :	C.C.	Date :	13 December 2016
Checked By :	T.D.	Date :	13 December 2016
Approved By :	S.P.	Date :	13 December 2016

Drawing No. :
O14SUN_EXFCD_F0_03

Map Series : Page 3 of 4

Drawing Scale : 1:5,000 @ A3

0 50 100 200 300 400 500 Metres

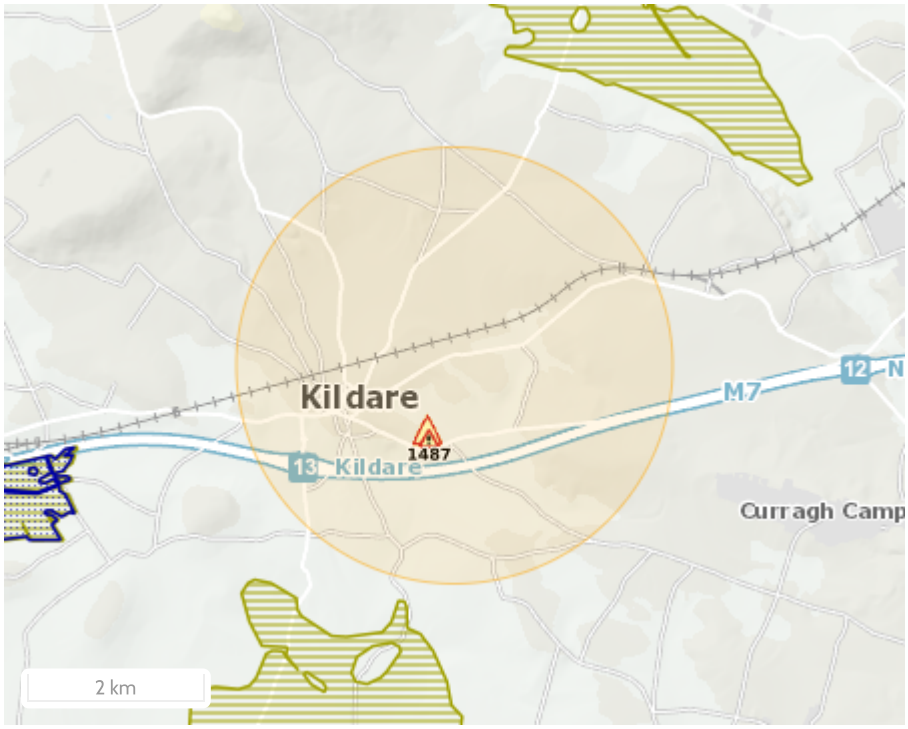
APPENDIX C – PAST FLOOD SUMMARY REVIEW

Past Flood Event Local Area Summary Report

Report Produced: **25/5/2023 9:41**

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

This report has been downloaded from www.floodinfo.ie (the "**Website**"). The users should take account of the restrictions and limitations relating to the content and use of the Website that are explained in the Terms and Conditions. It is a condition of use of the Website that you agree to be bound by the disclaimer and other terms and conditions set out on the Website and to the privacy policy on the Website.



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

1 Results

	Name (Flood_ID)	Start Date	Event Location
1.	Kildare Town Recurring (ID-1487)	n/a	Approximate Point

Additional Information: Reports (1) Press Archive (0)