

Glenageary Gate LRD

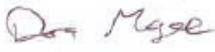
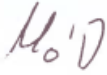
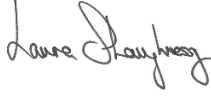

LRD Stage 3 Planning Application to Dun Laoghaire-
Rathdown County Council
Flood Risk Assessment

Red Rock Glenageary Ltd

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1. Introduction

1.1 Background

AECOM have been appointed by Red Rock Glenageary Ltd. to undertake a Flood Risk Assessment (FRA), the site is located within the jurisdiction of Dún Laoghaire-Rathdown County Council (DLRCC) and is subject to the DLRCC County Development Plan 2022-2028.



Figure 1.1: Site Location (Source: Google Maps)



Figure 1.2: Site Location relative to potential Flood Sources

Brock McClure Planning & Development Consultants submitted a Section 247 planning pack to DLRCC and attended the subsequent S247 meeting on MS Teams with DLRCC.

This site-specific FRA has been prepared to accompany the planning application for the proposed development. This FRA has been prepared in line with the requirements of “The Planning System and Flood Risk Management Guidelines for Planning Authorities”, (The 2009 Guidelines) as published in November 2009, and the particular

requirements of a site-specific Flood Risk Assessment as outlined in Appendix A of the Technical Appendices to those Guidelines.

Red Rock Glenageary Ltd., intend to apply to Dún Laoghaire Rathdown County Council for a Large-Scale Residential Development on a site of 0.74 ha at Junction of Sallynoggin Road and Glenageary Avenue, and Glenageary Roundabout, Glenageary, Co. Dublin.

The proposed development will consist of a new neighbourhood centre to include apartments, commercial and retail units, public plaza, childcare facility and all associated residential amenity spaces.

The proposed development includes:

- a) Construction of 138 no. residential apartment units (37 no. 1-bedroom units, 68 no. 2-bedroom (4 person units), 6 no. 2-bedroom (3 person units) and 27 no. 3-bedroom units) in 2 no. interlinked blocks at third to fifth floor level (ranging in height from four to seven storeys over basement level) consisting of:
 - i. Block A (5-6 storeys) comprising 41 no. apartments (8 no. 1-bedroom units, 17 no. 2-bedroom (4 person) units, 2 no. 2-bedroom (3 person) units and 14 no. 3-bedroom units).
 - ii. Block B (4-7 storeys) containing 97 no. apartments (29 no. 1-bedroom units, 51 no. 2-bedroom (4 person) units, 4 no. 2-bedroom (3 person) units and 13 no. 3-bedroom units).

Each residential unit has associated private open space in the form of a balcony/terrace.

- b) Residential amenity areas of approx. 342 sqm are proposed in the form of resident support services, concierge services, co-working space, social/activity spaces and gym at the ground floor level of Blocks A and B.
- c) Open Space (approx. 2,806.6 sqm) is proposed in the form of (a) public open space (c. 1,848.4 sqm) in the form of a public plaza accommodating outdoor seating, planting, pedestrian footpaths and cyclist links and (b) residential/communal open space (approx. 958.2 sqm) including c. 750.6 sqm at surface level (incl. playground), roof terrace at fifth floor level of link between Blocks A and Block B (c. 151 sqm) and roof terrace (c. 56.6 sqm) at fifth floor level of Block B. 1.8 m opaque screens are proposed around both roof gardens.
- d) Commercial and retail uses at ground floor level of Blocks A and B (c. 996 sqm) to include (a) 2 no. restaurants (c. 267 sqm and 295 sqm) in Block A, (b) a retail – clothing unit (c. 142 sqm), (c) retail - florist unit (c. 66 sqm), (d) retail - pharmacy unit (c. 126 sqm) and (e) hairdresser unit (c. 100 sqm) all in Block B.
- e) Childcare facility (c. 263 sqm) with dedicated open space and children's play area (c. 39.5 sqm) at ground floor level of Block B.
- f) Basement areas (total approx. 3,411 sqm) are proposed on one level and include car and bicycle parking areas, waste management and plant areas. An ESB substation (approx. 31.7 sqm) is proposed at surface level at the top of the basement ramp accessed off Glenageary Avenue. Commercial bin stores (c. 47.9 sqm) are proposed to be located at ground floor level of both Blocks A and B.
- g) A total of 80 no. car parking spaces at basement level are proposed to include 3 no. accessible parking spaces, 2 no. GoCar spaces and 17 no. EV charging spaces. 5 no. motorcycle parking spaces are also proposed at basement level.
- h) A set down area/loading bay is proposed at surface level at Sallynoggin Road and 2 no. set down areas/loading bays including 1 no. accessible car parking space are proposed at surface level at Glenageary Avenue.
- i) A total of 310 no. bicycle parking spaces to include 254 no. bicycle parking spaces at basement level including 10 no. cargo bicycle spaces and 56 no. bicycle parking spaces including 16 no. cargo bicycle spaces at surface level.
- j) The development shall be served via a new vehicular access point to the basement level from Glenageary Avenue. New pedestrian and cyclist access points will be provided onto Sallynoggin Road and Glenageary Avenue from the site.
- k) Removal of existing cycle path and footpath and dropped kerb pedestrian crossing at Glenageary Avenue to be reinstated by soft landscaping and replaced by a new shared cyclist and pedestrian raised table crossing

point located on Glenageary Avenue linking to the existing signalised crossing on the R118. Existing 1.2 m pedestrian crossing on Glenageary Avenue to be widened to 2 m.

- l) Emergency services/servicing access is proposed from Sallynoggin Road and Glenageary Avenue.
- m) All associated site and infrastructural works include provision for water services; foul and surface water drainage and connections; attenuation proposal; permeable paving; all landscaping works; green roofs; roof plant room and general plant areas; photovoltaic panels; landscaped boundary treatment; footpaths; public lighting; and electrical services.

2. Planning System & Flood Risk Guidelines

2.1 The Planning System and Flood Risk Management Guidelines, 2009

In September 2008 “The Planning System and Flood Risk Management Guidelines for Planning Authorities” (The 2009 Guidelines) were published by the Department of Environment, Heritage and Local Government in Draft format. In November 2009, the adopted version of the document was published.

The 2009 Guidelines provide guidance on flood risk and development. A precautionary approach is recommended 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 objective of a site-specific Flood Risk Assessment (FRA) is to assess all types of flood risk to a development. The assessment should investigate potential sources of flood risk and include for the effects of climate change. The assessment is required to examine the impact of the development and the effectiveness of flood mitigation and management procedures proposed. It should also present the residual risks that remain after those measures are put in place.

This approach is based on the identification of flood zones for river and coastal flooding. “Flood Zones” are geographical areas used to identify areas at various levels of flood risk. It should be noted that these do not consider the presence of flood defences, as the risks remain of overtopping and breach of the defences. The 2009 Guidelines outline three varieties of flood zones (refer to Figure 2.1):

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

Flood Zone B (moderate probability of flooding) refers to lands where the probability of flooding is moderate (between 0.1% or 1 in 1,000 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).

Flood 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).

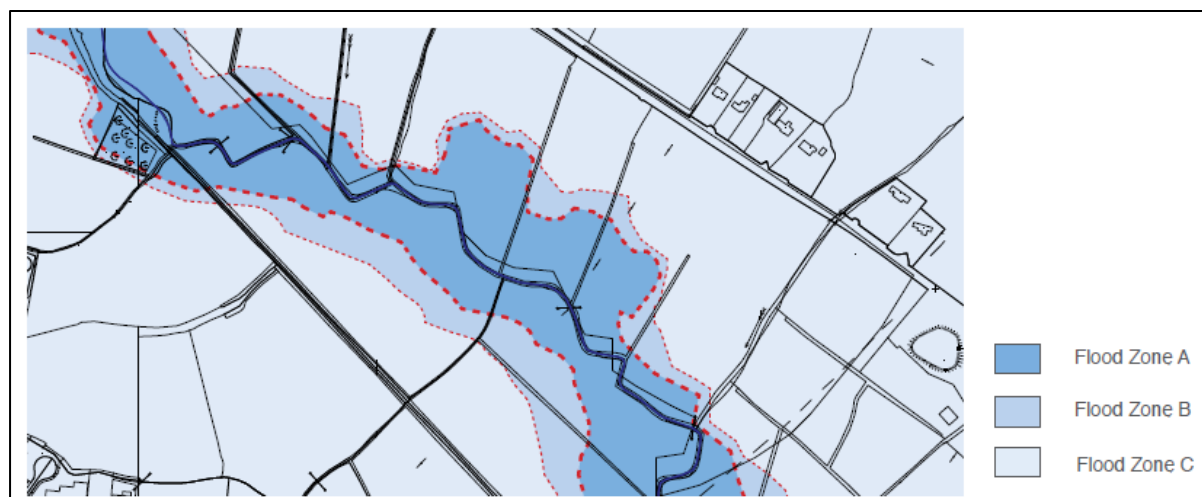


Figure 2.1: Indicative Flood Zone Map (Extract from The 2009 Guidelines)

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 (a rigorous assessment of the appropriateness of a development in light of moderate to high flood risk) 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.

The current Dun Laoghaire-Rathdown Development Plan 2022-2028 was adopted following the publication of the 2009 Guidelines and includes a Strategic Flood Risk Assessment.

The 2009 Guidelines set out a staged approach to assessment. The stages of assessment are:

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 to the development, impacts on flooding elsewhere and the effectiveness of any proposed mitigation measures.

This report addresses the requirements of a Stage 1 and 2 Site Specific Flood Risk Assessment.

The potential risk to the proposed development associated with each of the following sources of flooding is investigated in this report;

- Fluvial flooding,
- Pluvial flooding, and
- Groundwater Flooding.

2.2 DLRCC County Development Plan & Strategic Flood Risk Assessment 2022 – 2028

In preparation of the is flood risk assessment, AECOM have taken into consideration the DLRCC County Development Plan 2022 – 2028. DLRCC have produced a stand-alone Strategic Flood Risk Assessment (SFRA) in conjunction with the DLRCC County Development Plan in order to analyse the flood risks associated with the local area of Dun Laoghaire – Rathdown area in further detail. An overview of the general policies and objectives associated with flood risk mitigation for the Dun Laoghaire – Rathdown area can be found under section 10.7 of the County Development Plan.

The DLRCC SFRA provides further in-depth detail on the areas associated with potential flood risk, including the Deansgrange Stream. As noted in Section 6.2.9 (which assesses the Deansgrange Stream) of the SFRA, while there have been recent significant flooding events within this area, these events have been attributed to pluvial flooding, and not fluvial. Further detail on these events are outlined in Section 3.1 of this document.

Figure 2.2 is an extract from section 6.2.9 of the SFRA which shows the Deansgrange Stream floodplain and highlights the zoning objective associated with the proposed site location. An extract pertaining to the zoning objective for the proposed site can be found under Appendix D. The zoning objective states that this area is reserved “to protect, to provide for an-or improve mixed-use neighbourhood centre facilities”. A justification test is to be carried out in this area for highly vulnerable development in Flood Zones A and B, and for less vulnerable developments within Flood Zone A. The proposed development is found to be located within Flood Zone C as outlined under Section 6 of this document.

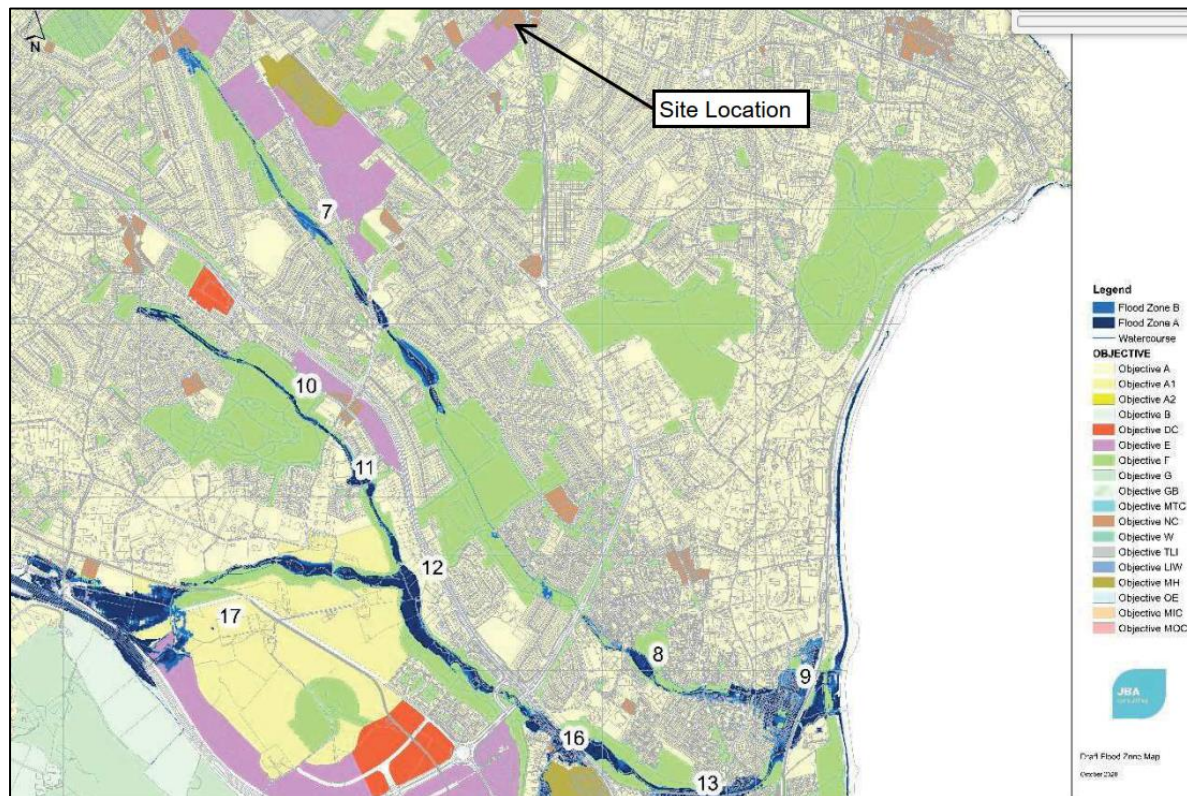


Figure 2.2: Deansgrange Stream Floodplain (DLR SFRA 2022-2028)

3. Flood Risk Identification (Stage 1)

As part of Stage 1 of the FRA, a review of historical flooding records and predictive flood mapping was carried out to identify the potential sources of flooding to the development site.

3.1 History of Flooding - OPW Flood Hazard Mapping

The Office of Public Works (OPW) collates available reports of flooding from all sources (e.g. fluvial, pluvial, coastal, etc.) on a nationwide basis. The OPW's website (www.floodmaps.ie) was consulted to obtain reports of recorded flooding within and surrounding the site. Figure 3.1 is an extract from the mapping available on the OPW database website, which indicates there are no historic records of flooding in the immediate vicinity of the site.

Figure 3.2 illustrates two previous single (non-recurring) flood events that have been recorded approximately 380 metres west of the site. The first of these events occurred in October 2002 when manhole covers lifted during a period "where all of the rivers and streams were flowing at full capacity, which only left a few inches to spare before flooding in all areas".

The second of these events occurred in October 2011, "The source of the flood waters was the overtopping of the Monkstown Stream. The capacity downstream (open channel and culvert) was exceeded and backup from this area resulted in the flooding of 10 residential properties. Construction site development works were ongoing on the site of the Old Dunlaoghaire Golf Course, which was immediately downstream of this area."

Refer to Appendix A for the OPW area summary and relevant flood reports.

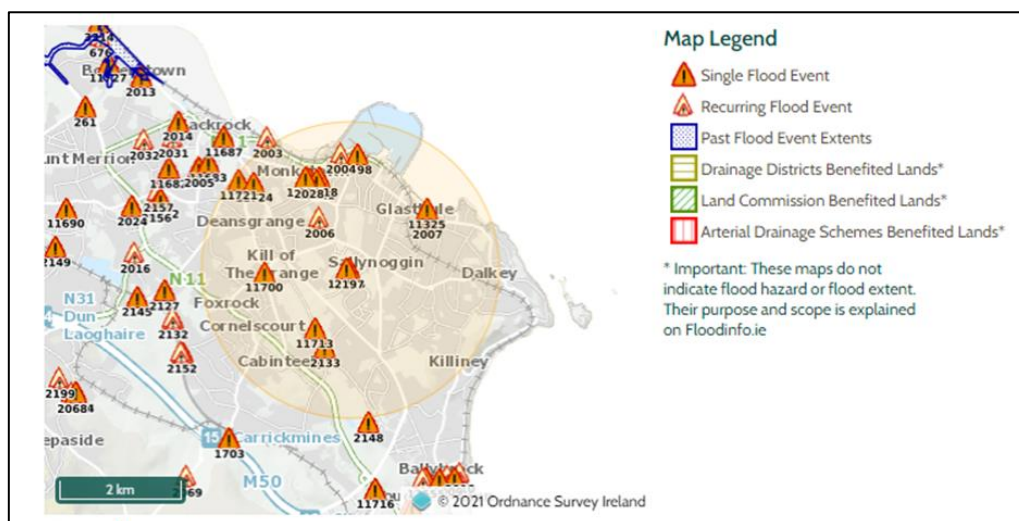


Figure 3.1: Floodinfo.ie map displaying recorded historical flood events

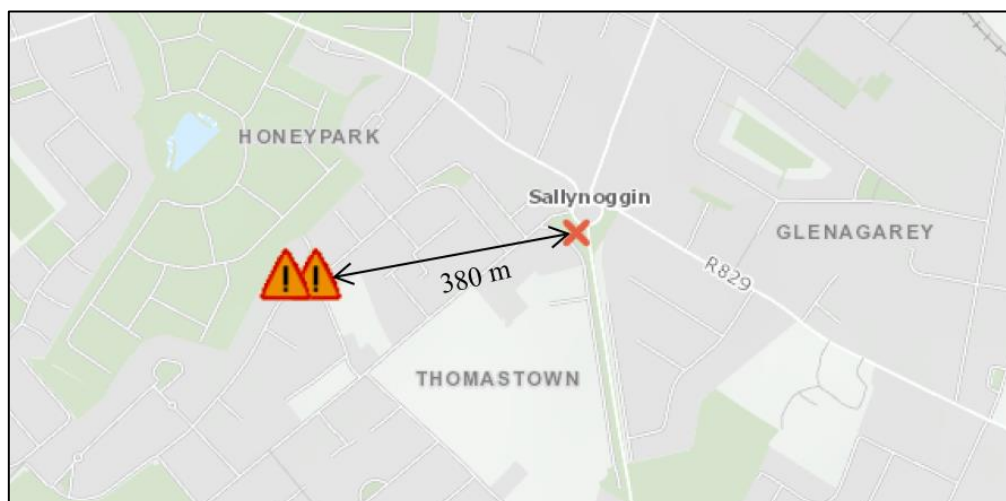


Figure 3.2: Recorded Historic Flood Events in the vicinity of the site (marked 'x')

3.2 CFRAM Predictive Flood Risk Mapping

The CFRAM (Catchment Flood Risk Assessment and Management) programme is a national programme which produced a series of Preliminary Flood Risk Assessment (PFRA) which cover the entire country. This assessment was carried out based on available and readily derivable information to identify areas where there may be a significant risk of flooding. The objective of the PFRA is to identify areas where the risks associated with flooding might be significant.

The PFRA was undertaken by:

- Reviewing records of flood that have happened in the past;
- Undertaking analysis to determine which areas might flood in the future, and what the impacts might be; and
- Consulting with Local Authorities and other Government departments and agencies.

The objective of the PFRA was to identify areas where the risk associated with flooding might be significant. These areas, which are referred to as 'Areas for Further Assessment' or AFAs, were selected for a more detailed assessment in order to accurately define the extent and degree of flood risk.

The CFRAM predictive flood risk mapping was based on the output of hydraulic modelling carried out as part of the study. The hydraulic model predicts the water levels for three fluvial flood events at given nodes. Based on the predicted water levels at these nodes, fluvial flood extents associated with the 10% AEP event, 1% AEP event (Flood Zone A), and the 0.1% AEP event (Flood Zone B) are mapped.

The CFRAM mapping, available on floodinfo.ie, (refer to Figure 3.3, or full map in Appendix B) displays the flood extent of the Deansgrange Stream for different fluvial events. This is approximately 1.5 km west of the proposed site and therefore the site is located in Flood Zone C, as it is located outside the flood extent area of the 0.1% fluvial AEP (Annual Exceedance Probability) event.

For node 1050M00544J, the Water Level (OD) 0.1% AE is at 34.58, while the existing ground levels at the site are greater than 43 m. The proposed basement level is 40.6 m, at the lower level.

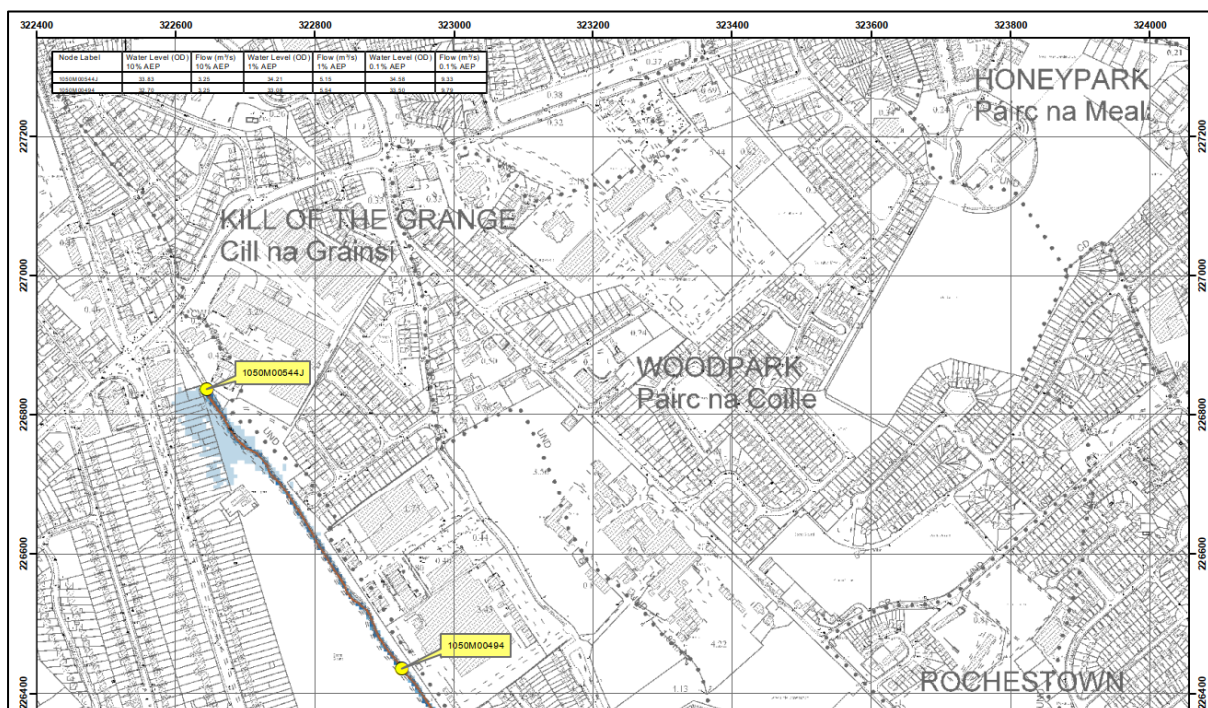


Figure 3.3: Fluvial CFRAM Flood Extensive Map (Full Map available in 7)

4. Initial Flood Risk Assessment (Stage 2)

4.1 Potential Sources of Flooding

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

- **Coastal/Tidal:** flooding caused by sea levels which are higher than normal, resulting in sea water overflowing onto the land.
- **Fluvial:** flooding because of a river exceeding its capacity, with excess water spilling out onto the adjacent floodplain.
- **Pluvial:** flooding from rainfall-generated overland flows with arise before run-off can enter any watercourse or sewer. It is usually associated with high intensity rainfall.
- **Geological Soil Conditions:** flooding which occurs when the natural underground drainage system cannot drain rainfall away quick enough, causing the water table to rise above the ground surface.

4.1.1 Coastal Flooding

Due to the inland location of Sallynoggin and the subject site itself, the risk of coastal flooding is considered to be extremely low. As shown in Figure 4.1 below, the nearest coastline to Sallynoggin is north-east of the town, approximately 1.4 km away.



Figure 4.1: Distance from Sallynoggin to Nearest Coastline

4.1.2 Fluvial Flooding

Fluvial flooding is the result of a river exceeding its capacity and excess water spilling out on to the adjacent floodplain. Mapping published as part of the OPW CFRAM Study is used to evaluate the fluvial flood risk to the proposed development. From a review of this mapping, it is concluded that the site is located within Flood Zone C, as it is approximately 1.5 km from the Deansgrange Stream.

4.1.3 Pluvial Flooding

The proposed development includes a separate surface water drainage network to collect run-off generated within the site. This system will collect rainfall generated run-off within the site and convey flows through the proposed network.

It is proposed to restrict surface water run-off from the development to a maximum of 3 l/s, by providing a Hydrobrake flow control system (or similar approved). It is proposed to attenuate run-off in excess of greenfield run-off rates by providing attenuation within the proposed drainage network. The proposed attenuation storage has been designed using a 1 in 100-year return period rainfall event, with a 20% increase in rainfall depths to allow for the impact of climate change on rainfall, in accordance with the Greater Dublin Strategic Drainage Study. Refer to Section 5 for an assessment of the proposed drainage network and associated water levels within the network for the critical rainfall events.

4.1.4 Geological Soil Conditions

The Geological Survey of Ireland (GSI) published data has been used in this study to get an indication of the geological soil conditions, most notably, the subsoil permeability and any potential groundwater vulnerability based on GSI records. A Site investigation was also undertaken on November 2020 to obtain further detail on the groundwater flooding.

4.1.4.1 Groundwater Vulnerability

The available data on groundwater vulnerability shows the subject site and adjacent areas to be moderately vulnerable to groundwater flooding. AECOM appointed Site Investigations LTD to further understand the flooding characteristics associated with the site. Refer to Figure 4.2 below for details of the GSI records obtained.

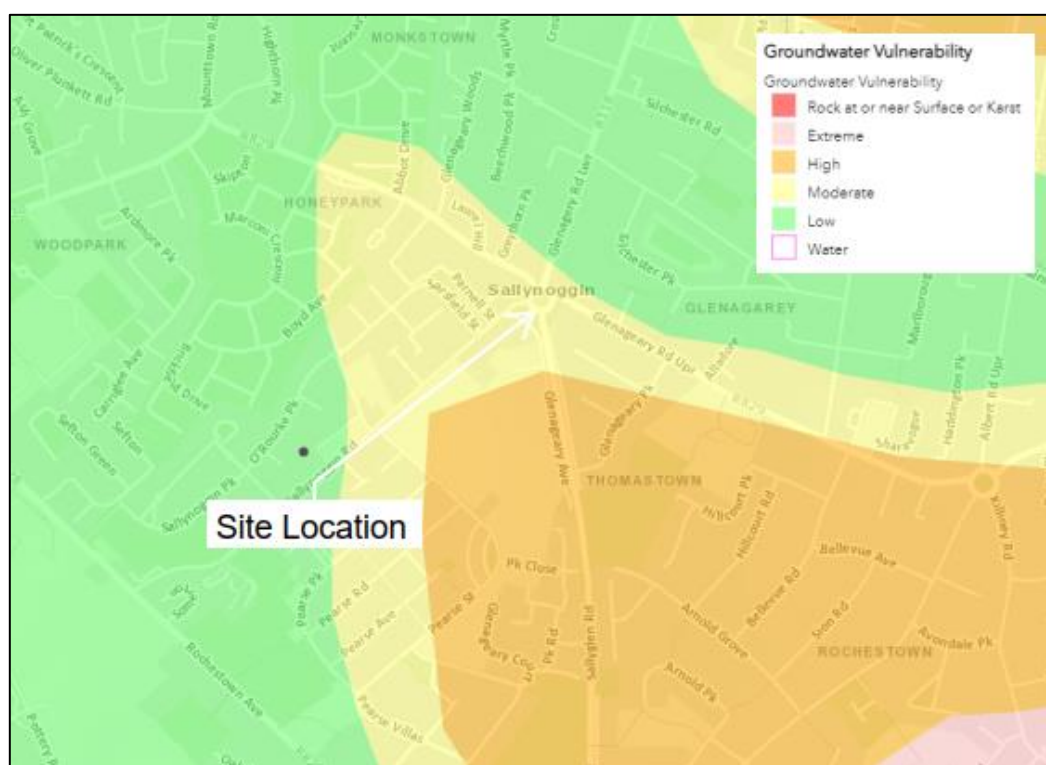


Figure 4.2: Groundwater Vulnerability obtained from GIS

4.1.4.2 Groundwater Flooding

Site Investigation Ltd (SIL) were appointed to undertake site investigation on the subject site. These investigations were completed in November 2020. Please refer to Appendix A of the Infrastructure Report for full site investigation (report no. 5787).

Groundwater ingresses were not recorded in the boreholes or trial pits during the fieldworks period. Standpipe readings indicate a high groundwater table. This high groundwater table has been accounted for in the design, by incorporating impermeable membranes at the sub-base of permeable paving, thereby ensuring groundwater will not permeate to the surface through these Sustainable urban Drainage Systems (SuDS) measures.

4.1.4.3 Subsoil Permeability

The available data shows the subsoil permeability to be low across the full extent of the subject site as well as the surrounding area. Figure 4.3 below illustrates this below.

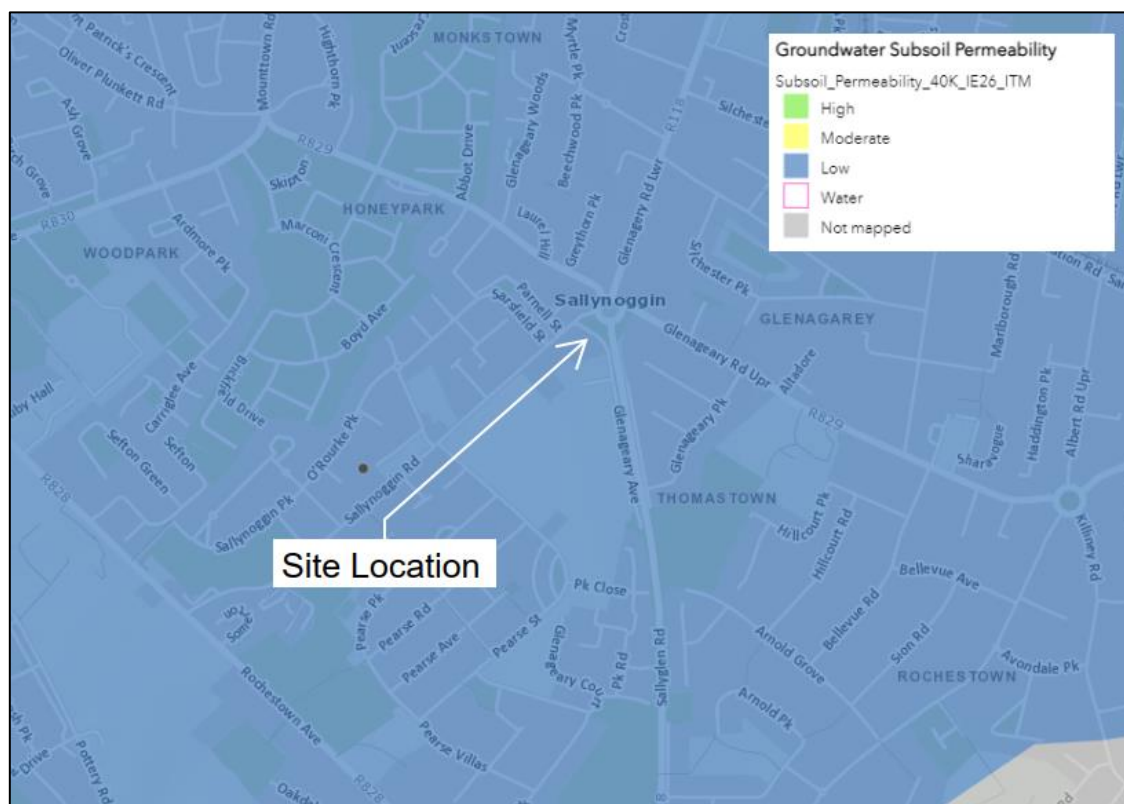


Figure 4.3: Subsoil Permeability obtained from GIS

4.2 Climate Change

The CFRAM map outputs, discussed in Section 3.2, are a 'present day scenario' as allowances for climate change are not included.

Advice on the expected impacts of climate change and the allowances to provide for future flood risk management in Ireland is given in the "OPW Assessment of Potential Future Scenarios, Flood Risk Management Draft Guidance", 2009. Two climate change scenarios are considered, the Mid-Range Future Scenario (MRFS) and the High-End Future Scenario (HEFS).

The MRFS is intended to represent a 'likely' future scenario based on the wide range of future predictions available. The HEFS represents a more 'conservative' future scenario at the upper boundaries of future projections. Based on these two scenarios, the OPW recommended allowances for climate change are given in Table 4.1.

Table 4.1: Recommended allowances for climate change

Parameter	MRFS	HEFS
Flood Flows	+20%	+30%
Mean Sea Level Rise	+500 mm	+1000 mm
Land Movement	-0.5 mm/year *	-0.5 mm/year *
Forestation	-1/6 Tp**	-1/3 Tp** +10% SPR ***

Notes:

* Applicable to the southern part of the country (Dublin – Galway and south of this).

** Reduce the time to peak (Tp) by a third; this allows for potential accelerated run-off that may arise as a result of drainage of afforested land.

*** Add 10% to the Standard Percentage Run-off (SPR) rate; this allows for increased run-off rates that may arise following felling of forestry.

The modelled future scenarios (MRFS & HEFS) of the 1:1000 year fluvial flood event (low probability, shown in light blue), available on floodinfo.ie, reveal there is no foreseeable fluvial flood risk to the for these future scenarios and associated climate change. Refer to Figure 4.4 for the HEFS low-high probability flood extents.

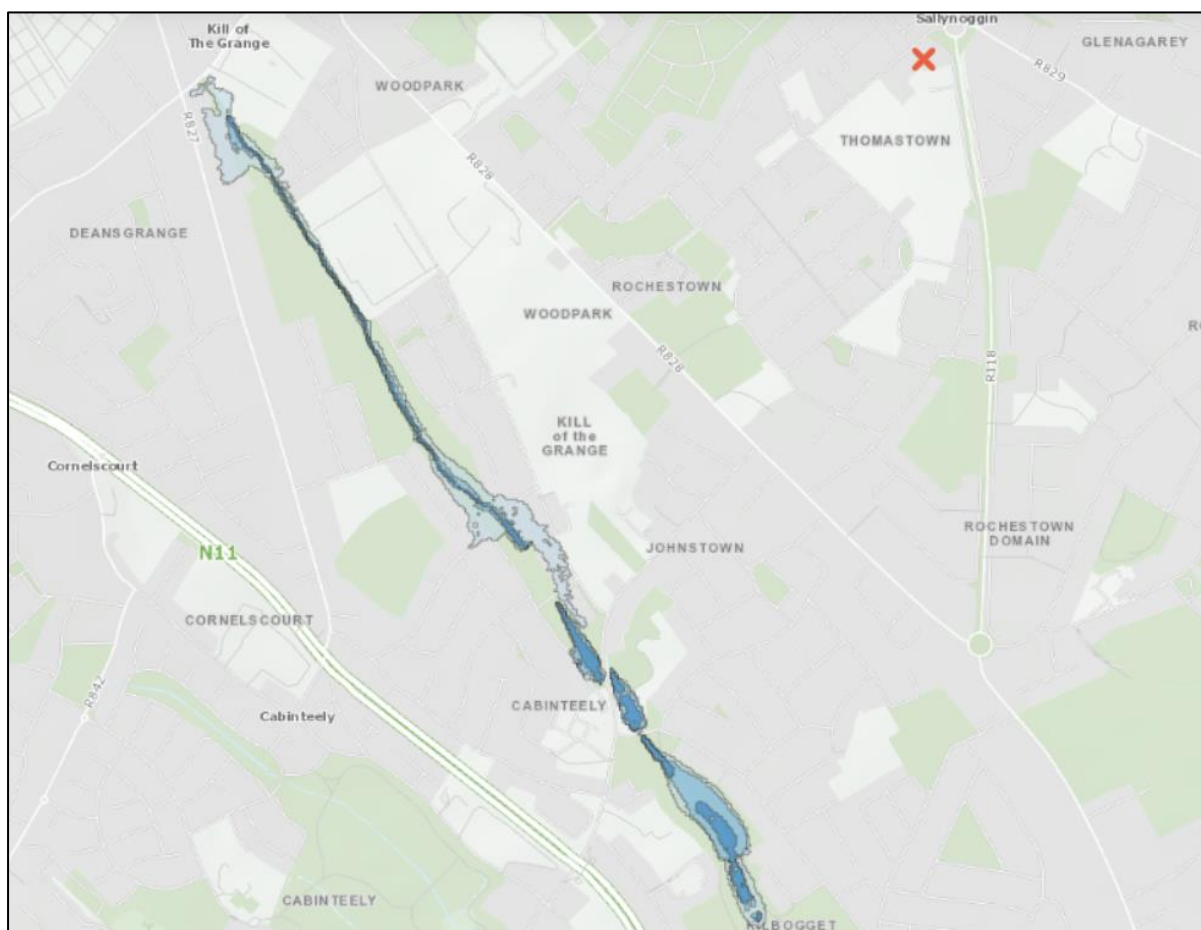


Figure 4.4: High-End-Future Scenario (Low, Medium & High Probability shown)

5. Drainage Impact Assessment

The Strategic Flood Risk Assessment (SFRA), Appendix 15 of the DLRCC Development Plan, outlines a requirement that all proposed developments, including those in Flood Zone C, must undertake a drainage impact assessment.

As discussed in Section 4.1.3, it is proposed to attenuate run-off from the site by restricting discharge from the site at a rate of 3 l/s. The proposed drainage network also includes a 20% allowance for an increase in rainfall depths due to climate change. Therefore, the proposed development would cause no additional flood risk to the surrounding area.

The proposed SuDS measures, as shown in AECOM drawing no. 60690914-ACM-XX-00-DR-CE-10-0520 (refer to AECOM's accompanying Infrastructure Report for further detail), will help to reduce the rate of run-off from the site by allowing longer retention times on site and reducing the amount of run-off overall by providing interception through evapotranspiration from the green roofs, soft landscaping and permeable paving. The proposed SuDS measures also provide a better water quality discharging from the site as the proposed SuDS measures remove pollutants and suspended solids at source.

A surcharge analysis has been carried out for the critical storm and corresponding maximum water levels. In summary, the maximum water level in the proposed drainage network is 43.182 m, at manhole S1. This is 618 mm below the Finished Ground Floor Level of the building.

6. Flood Risk Management

Chapter 3 of the Planning System and Flood Risk Management Guidelines (DEHLG/ OPW, 2009) describes the key principles of a risk based sequential approach to managing flood risk. The sequential approach is aimed at directing development toward land that is at low risk of flooding. Figure 6.1 is extracted from the 2009 Guidelines and illustrates the sequence in which a site must be assessed from a flood risk standpoint. The planning authority must be satisfied of the following points, in this order:

- *Avoid* (locate in an area that is not prone to flooding);
- then *Substitute* (if in a flood risk zone, then substitute the type of development);
- *Justify* (if substitution does not reduce flood risk sufficiently, then perform Justification Test); and
- *Mitigate*.

This section discusses the sequential approach recommended in the 2009 Guidelines with regard to the proposed development.

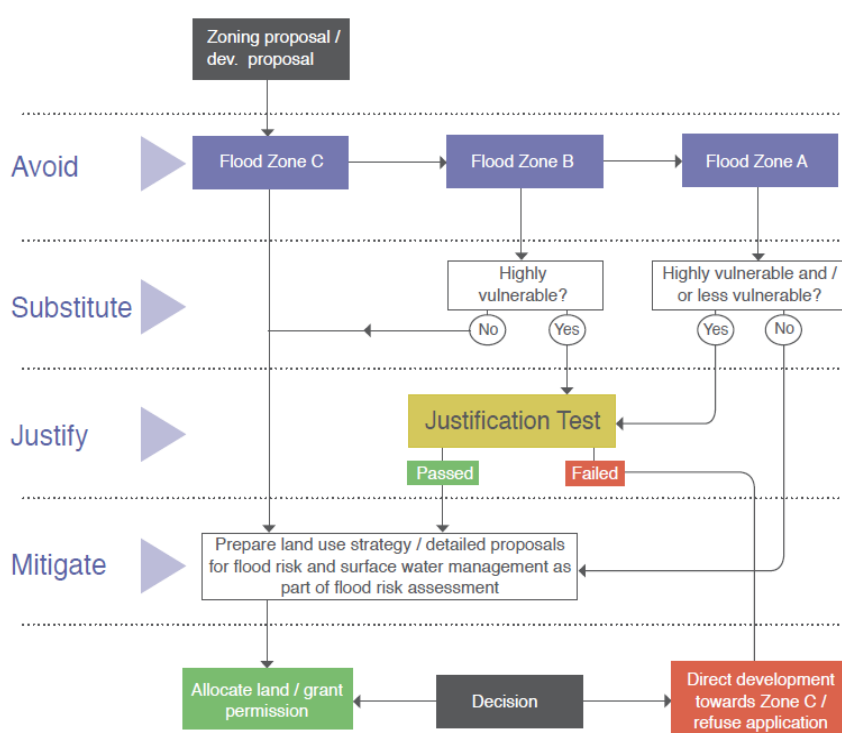


Figure 6.1: Sequential Approach Mechanism in the Planning Process

6.1 Sequential Approach

The first stage of the sequential approach is to avoid development in areas at risk of flooding. Flood Zones associated with river and coastal flooding are identified as Flood Zones A, B and C (refer to Section 2.1 for definitions). The planning implications for each of the flood zones include:

Flood Zone A – High probability of flooding: most types of development would be considered inappropriate in this zone. Development in this zone should be avoided or only considered in exceptional circumstances, such as in city and town centres where the Justification Test has been applied. Water compatible development such as docks or marinas, dockside activities that require a waterside location, amenity open space, outdoor sports and recreation would be considered appropriate in this zone.

Flood Zone B – Moderate probability of flooding: highly vulnerable development would generally be considered inappropriate in this zone, unless the requirements of the Justification Test can be met. Less vulnerable development and water compatible development would be considered appropriate in this zone. In general, less vulnerable development should only be considered in this zone if adequate lands or sites are not available within

Flood Zone C and subject to a flood risk assessment to the appropriate level of detail to demonstrate that flood risk to and from the development can or will be adequately managed.

Flood Zone C – Low probability of flooding: Development in this zone is considered appropriate from a flood risk perspective (subject to assessment of flood hazard from sources other than rivers and the coast) but would need to meet the normal range of other proper planning and sustainable development considerations.

The second stage of the sequential approach is to substitute the type of development to one less vulnerable to flooding.

6.2 Vulnerability

Table 3.1 of The Planning System and Flood Risk Management Guidelines for Planning Authorities, 2009, provides a classification of vulnerability of different types of development. Figure 6.2 is taken from the 2009 Guidelines (Table 3.1) and sets out the Vulnerability Classifications of different types of land uses. Figure 6.3 (Table 3.2 of the 2009 Guidelines) describes the vulnerability of developments relative to the identified Flood Zone and when the requirements of the Justification Test must be satisfied.

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 3.1 Classification of vulnerability of different types of development

Figure 6.2: Classification of Vulnerability (Table 3.1 taken from the 2009 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

Table 3.2: Matrix of vulnerability versus flood zone to illustrate appropriate development and that required to meet the Justification Test.

Figure 6.3: Matrix of Vulnerability (Table 3.2 taken from the 2009 Guidelines)

The proposed land use for the proposed development is residential, which falls within the 'Highly Vulnerable Development' classification, as shown in Figure 6.2. Based on the review carried out of the predicted flood water levels and the topographical survey, the proposed residential units have been located outside Flood Zones A and B and within Flood Zone C (Low probability of flooding). As shown in Figure 6.3, Flood Zone C is a suitable land use for Highly Vulnerable Developments.

7. Conclusion

This site-specific Flood Risk Assessment has been carried out to accompany the planning application for a Large scale Residential Development at Sallynoggin Road/Glenageary Avenue, Glenageary, Dublin 18. This report was written with "The Planning System and Flood Risk Management Guidelines for Planning Authorities, 2009" in mind and follows the requirements of a Stage 1 and 2 Flood Risk Assessment.

All existing information has been reviewed regarding the flood risk in the area, there is no recorded history of flood events in the immediate vicinity of the site. The CFRAM fluvial flood risk mapping is considered to have the most up to date and reliable estimates of extreme water levels, the DLRCC SFRA is based on the CFRAM model. This mapping provides estimated water levels associated with a 1:10 year event (Flood Zone A), 1:100 year event (also Flood Zone A) and 1:1000 year event (Flood Zone B). This mapping confirms that the site is not currently at risk of fluvial flooding.

Available future scenario models including climate change allowances, do not predict an increase in flood extent onto the site, i.e., the site remains in Flood Zone C which is most preferable for residential developments.

The proposed attenuation storage has been designed using a 1 in 100-year return period rainfall event, with a 20% allowance for an increase in rainfall depth to allow in consideration of the impact of climate change. The proposed SuDS measures and restriction of run-off to greenfield run-off rates means there will not be an increase in flood risk as a result of the proposed development.

In the event of a blockage at the flow control within the stormwater drainage network, flood water will flow away from the buildings, towards Sallynoggin Road.

Appendix A – OPW Historic Flood Records

Past Flood Event Local Area Summary Report

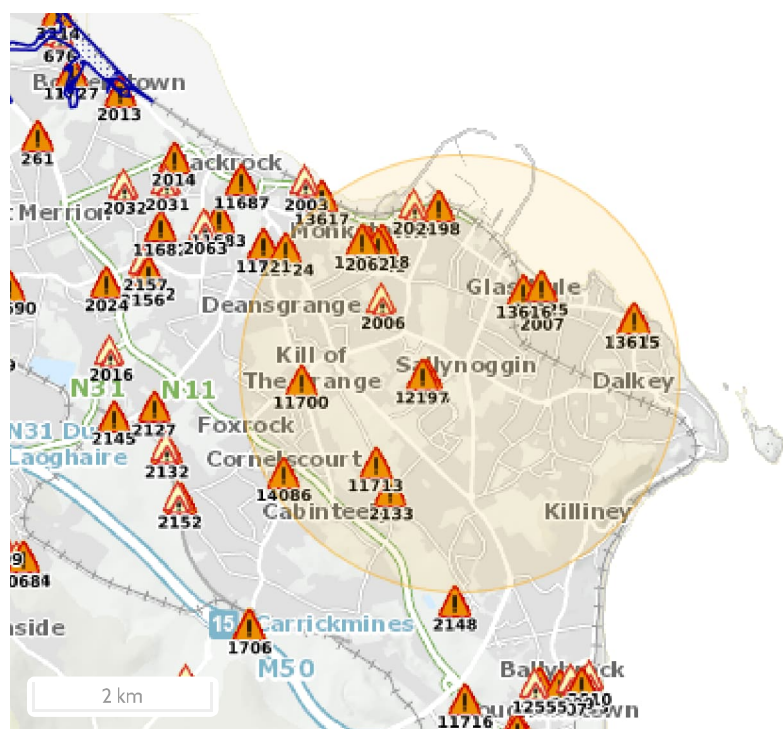


OPW Oifig na nOibreacha Poiblí
Office of Public Works

Report Produced: 28/10/2022 15:13

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*

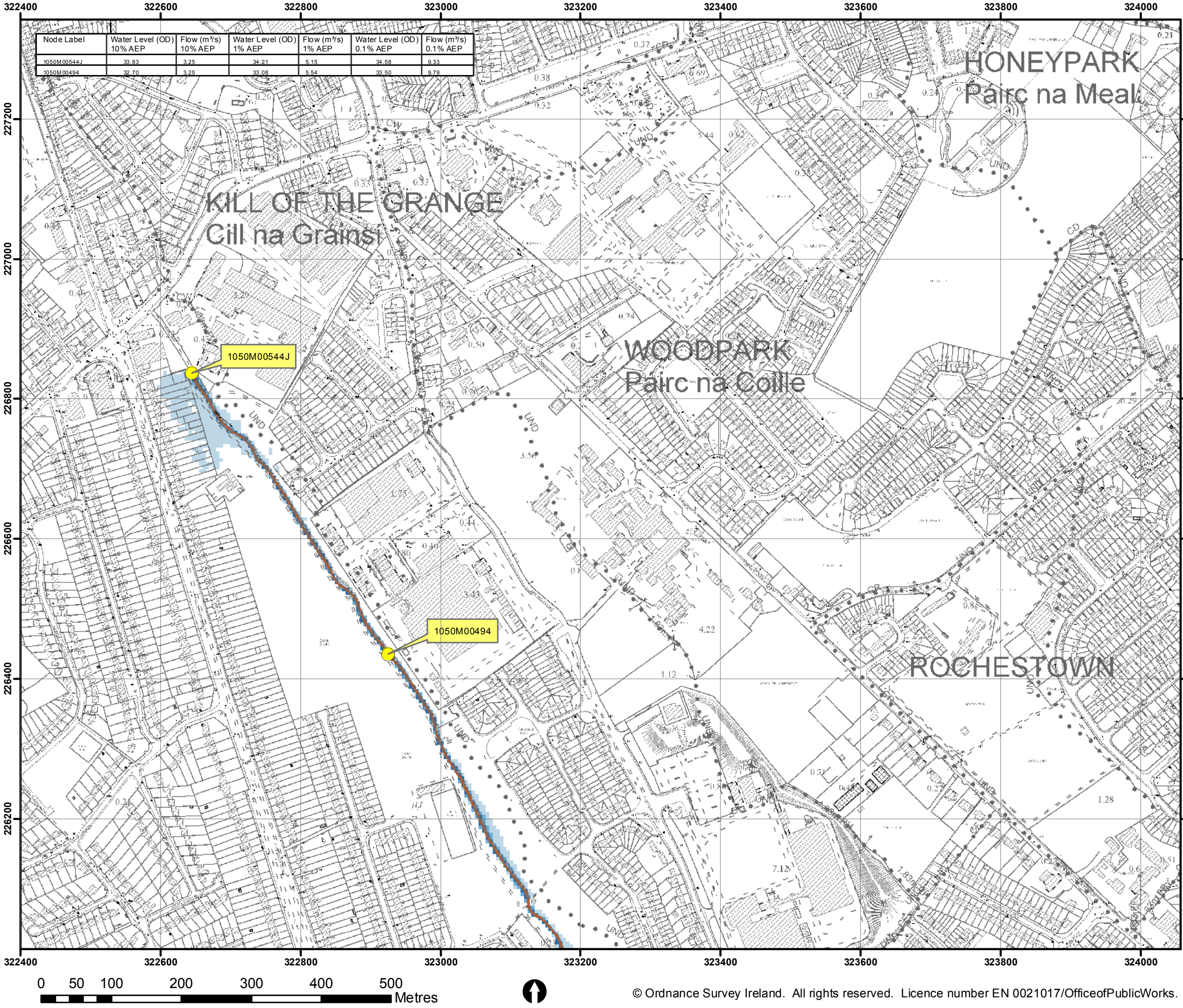
* Important: These maps do not indicate flood hazard or flood extent. Their purpose and scope is explained on Floodinfo.ie

20 Results

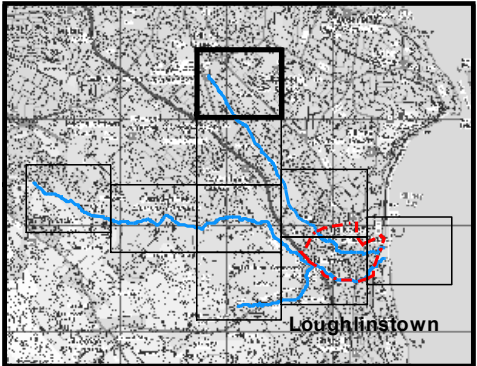
Name (Flood_ID)	Start Date	Event Location
1. Carrickbrennan Road May 1993 (ID-2062) Additional Information: Reports (3) Press Archive (Q)	25/05/1993	Exact Point
2. Deansgrange Johnstown Pottery Road Nov 1982 (ID-2133) Additional Information: Reports (1) Press Archive (Q)	05/11/1982	Exact Point
3. O Rourke Park Sallynoggin Oct 2002 (ID-2197) Additional Information: Reports (1) Press Archive (Q)	20/10/2002	Exact Point
4. Crofton Road Oct 2002 (ID-2198) Additional Information: Reports (1) Press Archive (Q)	20/10/2002	Exact Point
5. Flooding at Gasthule on 02/03/2018 (ID-13616) Additional Information: Reports (Q) Press Archive (Q)	02/03/2018	Approximate Point
6. Flooding at Pakenham Road, Monkstown, Co. Dublin on 24th Oct 2011 (ID-11718) Additional Information: Reports (1) Press Archive (Q)	23/10/2011	Exact Point

Name (Flood_ID)	Start Date	Event Location
7.  Flooding at Bullock Harbour, Dalkey on 2nd March 2018 (ID-13615) Additional Information: Reports (4) Press Archive (Q)	02/03/2018	Approximate Point
8.  Carrickbrennan Road Recurring (ID-2028) Additional Information: Reports (5) Press Archive (Q)	n/a	Exact Point
9.  Clearwater Cove Recurring (ID-2004) Additional Information: Reports (5) Press Archive (Q)	n/a	Exact Point
10.  Dunedin Monkstown Recurring (ID-2006) Additional Information: Reports (4) Press Archive (Q)	n/a	Exact Point
11.  Glashule Recurring (ID-2007) Additional Information: Reports (3) Press Archive (Q)	n/a	Exact Point
12.  Flooding at Cornelscourt Shopping Centre on 21/08/2021 (ID-14086) Additional Information: Reports (Q) Press Archive (Q)	21/08/2021	Approximate Point
13.  Pluvial Glashule 16th Aug 2008 and 2nd July 2009 (ID-11325) Additional Information: Reports (1) Press Archive (Q)	n/a	Approximate Point
14.  Monkstown Stream Monkstown Co Dublin Aug 2008 (ID-11321) Additional Information: Reports (1) Press Archive (Q)	n/a	Approximate Point
15.  Flooding at O'Rourke Park, Sallynoggin, Co. Dublin. on 24th Oct 2011 (ID-11715) Additional Information: Reports (1) Press Archive (Q)	23/10/2011	Exact Point
16.  Flooding at Alma Place, Carrickbrennan Road, Monkstown, Co. Dublin on 24th Oct 2011 (ID-11680) Additional Information: Reports (1) Press Archive (Q)	23/10/2011	Exact Point
17.  Flooding at Deansgrange Village, Deansgrange, Co. Dublin on 24th Oct 2011 (ID-11700) Additional Information: Reports (1) Press Archive (Q)	23/10/2011	Exact Point
18.  Flooding at Little Meadow, Pottery Road, Cabinteely, Dublin 18 on 24th Oct 2011 (ID-11713) Additional Information: Reports (1) Press Archive (Q)	23/10/2011	Exact Point
19.  Flooding at Stradbroke Gardens, Blackrock, Co. Dublin on 24th Oct 2011 (ID-11724) Additional Information: Reports (1) Press Archive (Q)	23/10/2011	Exact Point
20.  Flooding at Bullock Harbour, Dalkey on 18th March 2018 (ID-13622) Additional Information: Reports (2) Press Archive (Q)	18/03/2018	Approximate Point

Appendix B – CFRAM Fluvial Flood 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
1050M00544J	33.83	3.25	34.21	5.15	34.58	9.33
1050M00494	32.70	3.25	33.08	5.54	33.50	9.79



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

FINAL

REV:	NOTE:	DATE:
01	Removal of Embankments (Pg 5)	03/11/17





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Map:	Deansgrange Stream Fluvial Flood Extents		
Map Type:	EXTENT		
Source:	FLUVIAL		
Map Area:	HPW		
Scenario:	CURRENT		
Drawn By :	C.C.	Date :	3 November 2017
Checked By :	A.S.	Date :	3 November 2017
Approved By :	G.G.	Date :	3 November 2017
Drawing No. :	E10LOU_EXFCD_F1_07		
Map Series :	Page 7 of 9		
Drawing Scale :	1:5,000 @ A3		

Appendix C – Deansgrange Stream (County Development Plan 2022 – 2028 Flood Zone Map)

Mapping Notes

1. The lines of the Road Proposals shown are diagrammatic only and may be subject to change.
2. Wave Overtopping layer is relevant to the following maps only:
Map No's. 2, 3, 4, 7, 10 & 14 unless noted otherwise.
3. These flood maps contain Land Use Zonings & Flooding information only.
Please refer to the Land Use Zoning maps for more detailed land use objectives.

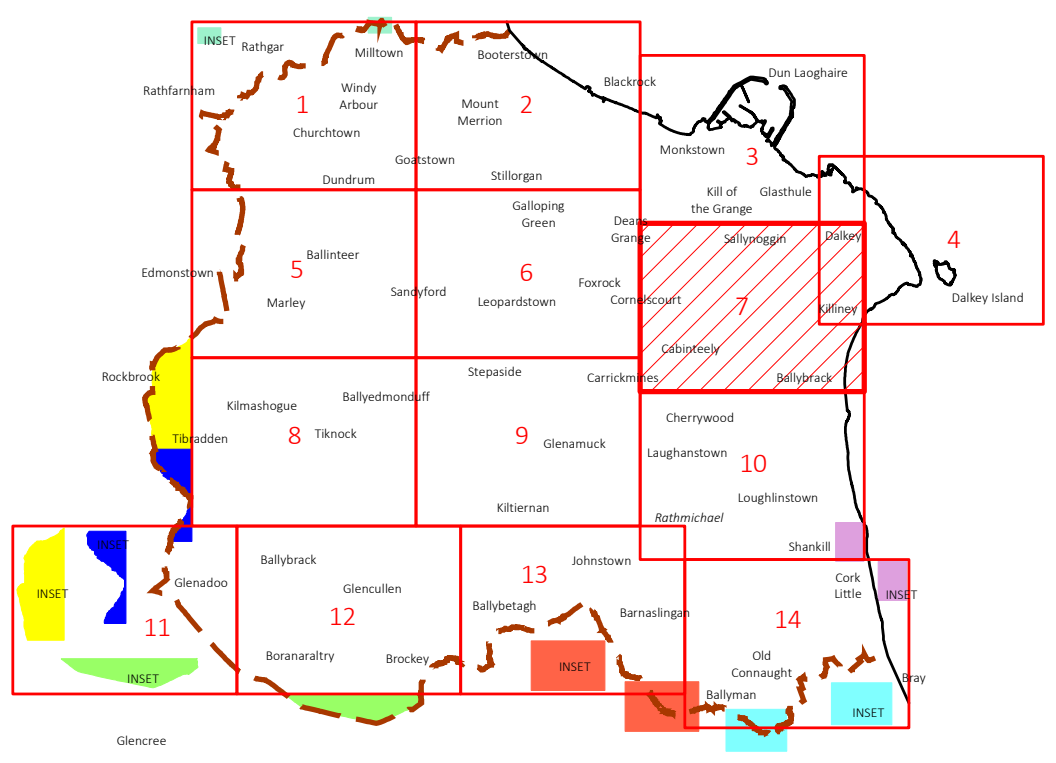
**Flood Zone
Map**

COMHAIRLE CHONTAE DHÚN LAOGHAIRE-RÁTH AN DÚIN

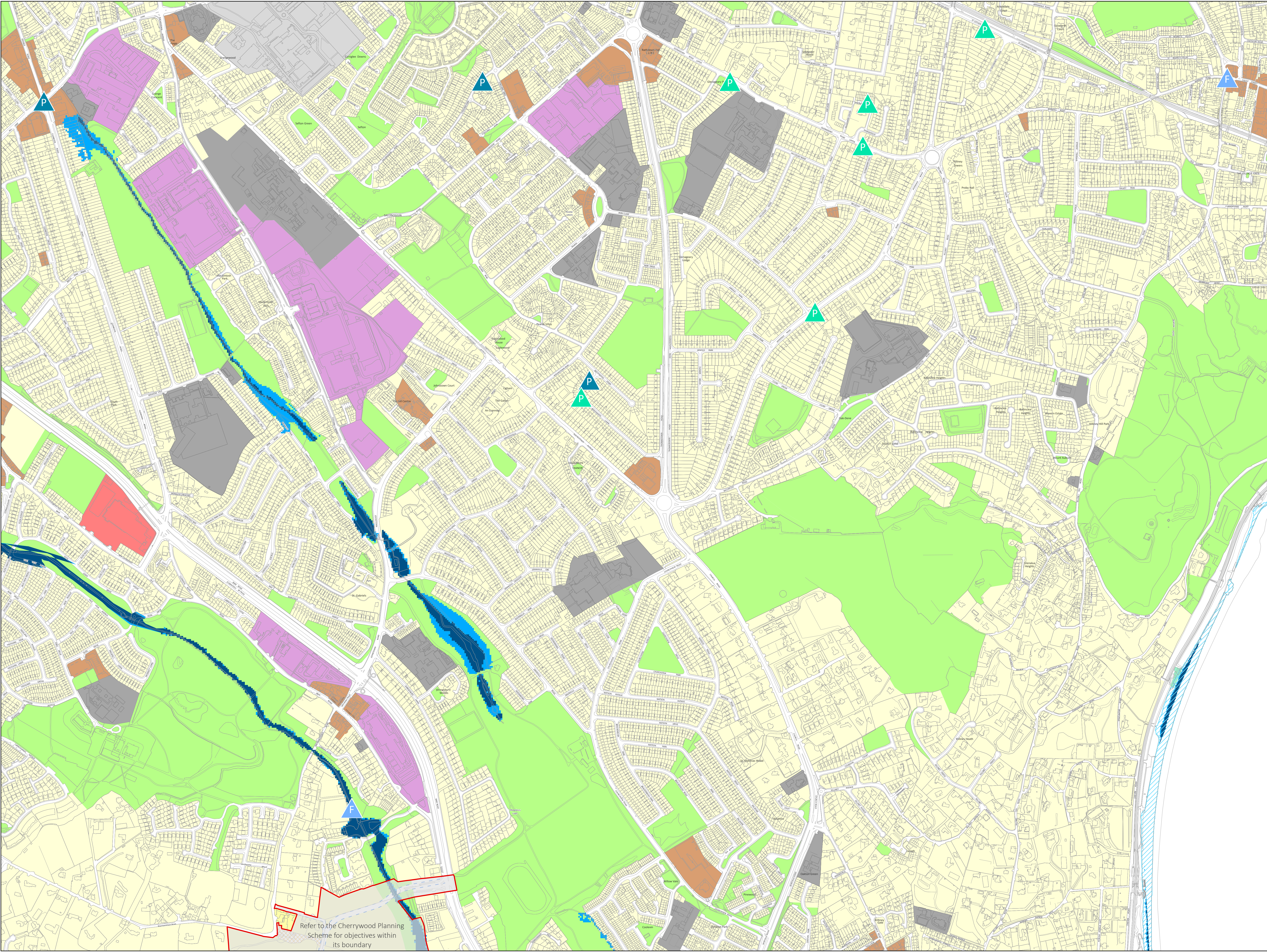
DÚN LAOGHAIRE-RATHDOWN COUNTY COUNCIL

COUNTY DEVELOPMENT PLAN 2022-2028

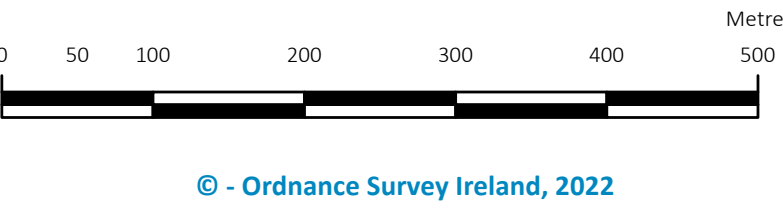
Adopted March 2022



INDEX



Land Use Zonings		
Objective A	To provide residential development and improve residential amenity while protecting the existing residential amenities.	
Objective A1	To provide for new residential communities and Sustainable Neighbourhood Infrastructure in accordance with approved local area plans.	
Objective A2	To provide for the creation of sustainable residential neighbourhoods and preserve and protect residential amenity.	
Objective B	To protect and improve rural amenity and to provide for the development of agriculture.	
Objective DC	To protect, provide for and/or improve mixed-use district centre facilities.	
Objective E	To provide for economic development and employment.	
Objective F	To preserve and provide for open space with ancillary active recreational amenities.	
Objective G	To protect and improve high amenity areas.	
Objective GB	To protect and enhance the open nature of lands between urban areas.	
Objective LIW	To improve and provide for low density warehousing/light industrial warehousing uses	
Objective MIC	To consolidate and complete the development of the mixed use inner core to enhance and reinforce sustainable development.	
Objective MOC	To provide for a mix of uses which complements the inner core, but with less retail and residential and more emphasis on employment and services.	
Objective MTC	To protect, provide for and/or improve major town centre facilities.	
Objective NC	To protect, provide for and/or improve mixed-use neighbourhood centre facilities.	
Objective OE	To provide for office and enterprise development.	
Objective TLJ	To facilitate, support and enhance the development of third level education institutions.	
Objective W	To provide for waterfront development and harbour related uses.	
Objective SNI	To protect, improve and encourage the provision of sustainable neighbourhood infrastructure	
Areas of Flood Risk Concern		
Fluvial - Surface Water		
Pluvial - Surface Water		
Pluvial - Foul		
Flood Zone A		
Flood Zone B		
Wave Overtopping		
County Boundary		
Boundary of Adopted Cherrywood Planning Scheme		



Director of Planning: M Henchy
Senior Planner: L McGauran