Proposed LRD at Taylors Lane, Ballyboden, Dublin 16

Site Specific Flood Risk Assessement

190068-X-X-X-XXX-RP-DBFL-CE-0001

INFRASTRUCTURE

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DBFL CONSULTING ENGINEERS

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1 INTRODUCTION

1.1 Background

DBFL Consulting Engineers were commissioned by the applicant to prepare a Site-Specific Flood Risk Assessment (SSFRA) for the proposed residential development at Taylors Lane, Ballyboden, Dublin 12. This SSFRA was prepared to comply with current planning legislation and forms part of proposed planning application for the subject site. A hydromorphological report in line with the Stage 2 South Dublin County Council (SDCC) opinion request has also been included with this report.

1.2 Objectives

The objectives of this report are to inform the planning authority regarding flood risk for the potential development of the lands. The report will assess the site and development proposals in accordance the requirements of "*The Planning System and Flood Risk Management Guidelines for Planning Authorities*".

The report will provide the following;

- The site's flood zone category.
- Information to allow an informed decision of the planning application in the context of flood risk.
- Appropriate flood risk mitigation and management measures for any residual flood risk

1.3 Flood Risk Assessment Scope

This SSFRA relates only to the proposed development site in the vicinity of Ballyboden and its immediate surroundings. This report uses information obtained from various sources, together with an assessment of flood risk for the existing land and proposed development. The report follows the requirements of '*The Planning System & Flood Risk Management – Guidelines for Planning Authorities'*, (referred to as the *Guidelines* for the remainder of this report).

1.4 Existing Site

The proposed site is located on the corner of Edmondstown Road, and Taylors Lane and the subject site is approximately net 3.50Ha. The site currently is unoccupied and consists of the old Good Counsel building and associated maintenance buildings. To the north and east there is a

large area of open space, which historically was a pitch and putt course, and this also forms part of the overall site.

The site is bound by Edmondstown Road to the west, Taylors Lane to the north, a private lane to the Augustinian Order to the east and an old mill race to the south.

As per South Dublin County Council's development plan, the site has been zoned RES, *to protect and/or improve residential amenity.*

Generally, the site is relatively flat although the levels bank up towards the exiting mill race to the south of the site.

The existing topography levels range from 76m AOD in the northern extent of the site to circa 79m AOD in the southern extents of the site.

Figure 1-1 Site Location (Site Boundary Indicative Only)

There are no EPA watercourses within the site boundary, although as previously stated, an old mill race bounds the southern boundary.

The nearest watercourses other than the mill race is the Owendoher River located to the west of the subject site, directly adjacent to Edmondstown Road. The Whitechurch Stream is also located approximately 750m east the development as shown in figure 1.2.

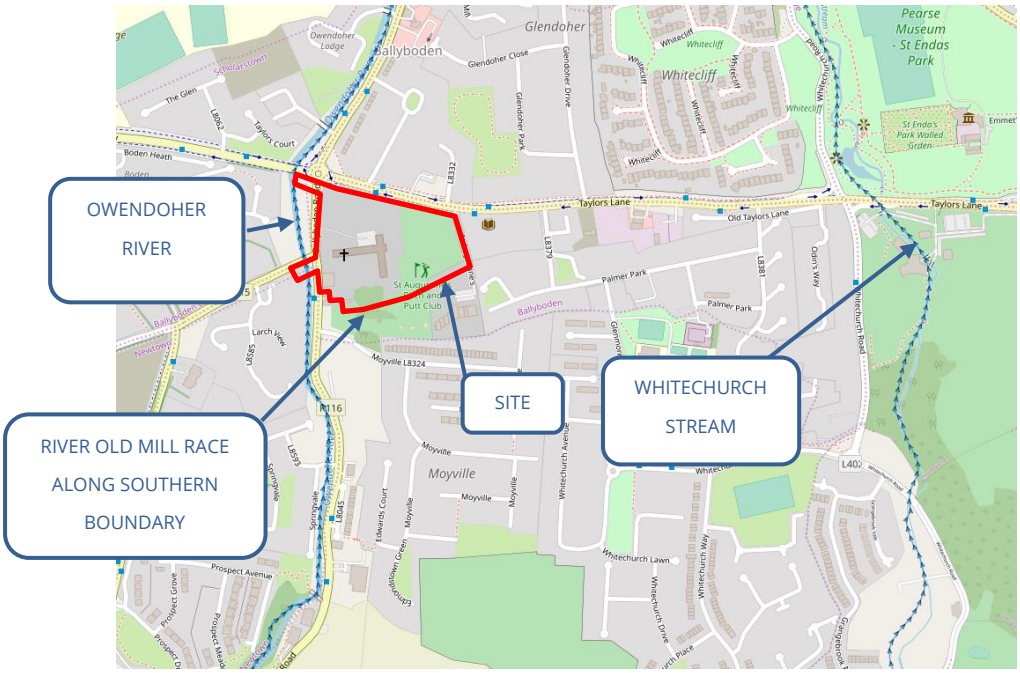


Figure 1-2 Extract from EPA online mapping

As per Figure 3-2 below, theFigure 1-1 Strategic Flood Risk Assessment conducted as part of the 2022 SDCC County Development Plan has identified the this particular site and the Pitch and Putt course to the south is located within a riparian corridor.

1.5 Proposed Development

The proposal is for a large-scale residential housing development on this site of net 3.5ha comprising the following:

- Demolition of existing former Institutional buildings and associated outbuildings (c.5231 sq.m);
- Construction of 402 residential units within 3 apartment/duplex blocks ranging in height from 2-5 storeys and comprising of 39 no. 1-Beds; 302 no. 2-Beds; and 61 no. 3-Beds all with associated private balconies/terraces to the north/south/east/west elevations;
- Provision of one crèche and two retail units.
- Provision of a new public park along Taylor's Lane
- Provision of 290 no. car parking spaces.
- Vehicular access to the site via Edmondstown Road to the west.
- Pedestrian Access to the site via Edmondstown Road to the west and Taylor's Lane to the north.

Please see the statutory notices for a full development description

2 PLANNING GUIDELINES & FLOOD RISK ASSESSMENT

2.1 The Planning System and Flood Risk Management, Guidelines for Planning Authorities

The FRM Guidelines provide "mechanisms for the incorporation of flood risk identification, assessment, and management into the planning process….". They ensure a consistent approach throughout the country requiring identification of flood risk and flood risk assessment to be key considerations when preparing development plans, local area plans and planned development.

"The core objectives of The FRM Guidelines are to:

- Avoid inappropriate development in areas at risk of flooding;
- Avoid new developments increasing flood risk elsewhere;
- Ensure effective management of residual risks for development permitted in floodplains;
- Avoid unnecessary restriction of national, regional, or local economic and social growth;
- Improve the understanding of flood risk among relevant stakeholders; and
- Ensure the requirements of EU and national law in relation to the natural environment and nature conservation are complied with for flood risk management."

The key principles of The FRM Guidelines are to apply the Sequential Approach to the planning process i.e.;

- "Avoid the risk, where possible,
- Substitute less vulnerable uses, where avoidance is not possible, and
- Mitigate and manage the risk, where avoidance and substitution are not possible."

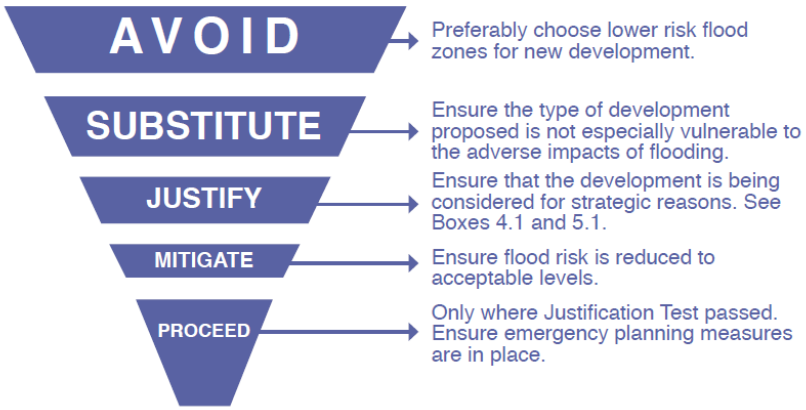


Figure 2-1 Sequential Approach Principles in Flood Risk Management

Where the *Sequential Test's* **avoid** and **substitute** principals are not appropriate then the FRM Guidelines propose that a *Justification Test* be applied to assess the appropriateness, or otherwise, of particular developments that are being considered in areas of moderate or high flood risk.

2.2 Flood Risk Assessment

The assessment of flood risk requires an understanding of where water comes from (the source), how and where it flows (the pathways) and the people and assets affected by it (the receptors).

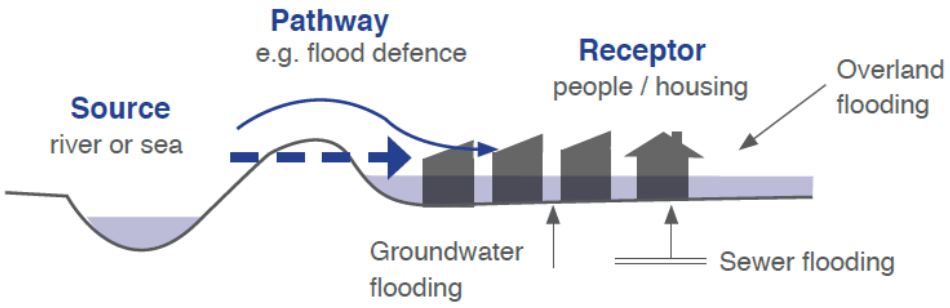


Figure 2-2 Source-Pathway-Receptor Model

The principal sources are rainfall or higher than normal sea levels. The principal pathways are rivers, drains, sewers, overland flow and river and coastal floodplains and their defence assets. The receptors can include people, their property, and the environment. All three elements are examined as part of the flood risk assessment including the vulnerability and exposure of receptors to determine potential consequences. Mitigation measures typically used in development management can reduce the impact of flooding on people and communities e.g., by blocking or impeding pathways. The planning process is primarily concerned with the location of receptors and potential sources and pathways that might put those receptors at risk.

Risks to people, property and the environment should be assessed over the full range of probabilities, including extreme events. Flood risk assessment should cover all sources of flooding, including effects of run-off from a development locally and beyond the development site.

2.2.1 Flood Risk Assessment Stages

The FRM Guidelines outline that a staged approach should be adopted when carrying out a flood risk appraisal or assessment. "These stages are:

- *Stage 1 Flood risk identification*
- *Stage 2 Initial flood risk assessment*
- *Stage 3 Detailed flood risk assessment*

The FRA Guidelines require a SSFRA be undertaken to assess flood risk for individual planning applications. This SSFRA comprises Stages 1, 2 and 3 involving both identification and more detailed assessment of flood risks and surface water management related to the planned development site.

2.3 Flood Zones

The FRM Guidelines use flood zones to determine the likelihood of flooding and for flood risk management within the planning process. The three flood zones levels are:

- Flood Zone A – where the probability of flooding from rivers and the sea is highest (greater than 1% AEP (Annual Exceedance Probability) or 1 in 100 for river flooding;
- Flood Zone B – where the probability of flooding from rivers and the sea is moderate (between 0.1% AEP or 1 in 1000 and 1% AEP or 1 in 100 for river flooding); and
- Flood Zone C – where the probability of flooding from rivers and the sea is low (less than 0.1% AEP or 1 in 1000 for both river and coastal flooding). Flood Zone C covers all areas outside zones A and B.

The FRM Guidelines categorises all types of development as either;

- Highly Vulnerable e.g., dwellings, hospitals, fire stations, essential infrastructure,
- Less Vulnerable e.g., retail, commercial or industrial buildings, local transport infrastructure.
- Water Compatible e.g., flood infrastructure, docks, amenity open space.

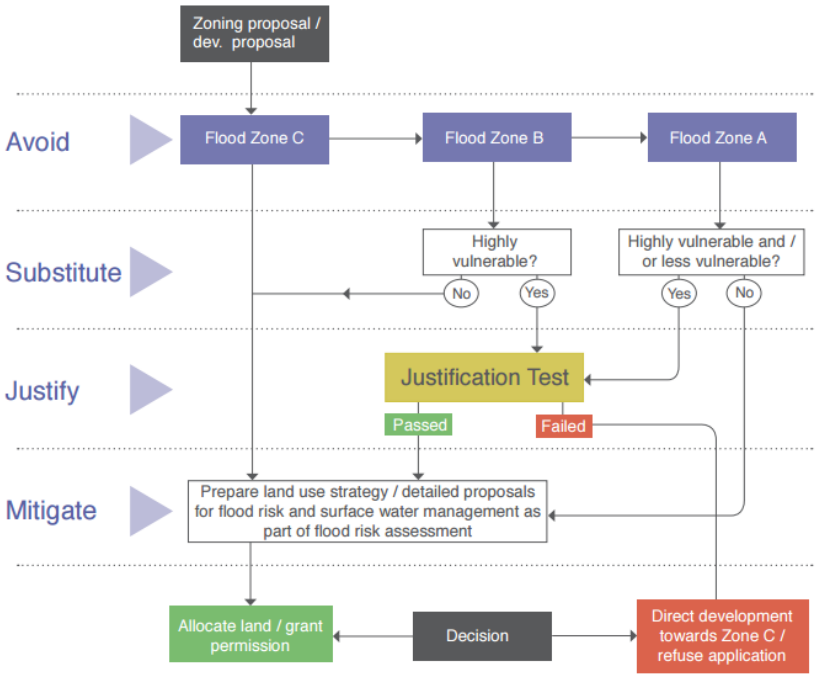


Figure 2-3 Sequential Approach mechanism in the Planning Process

The Sequential Approach restricts development types to occur within the flood zone appropriate to their vulnerability class.

	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

Figure 2-4 Table 3.2 from the FRA guidelines - Matrix of Vulnerability versus Flood Zone to illustrate appropriate development and that required to meet the Justification Test

2.4 Proposed Development's Vulnerability

The proposed type of development for this site is to be a mixed use of residential and commercial. Commercial is categorised by the Guidelines as **less vulnerable developments** and appropriate to be located within Flood Zone B and C. Residential developments are categorised as **highly vulnerable** and appropriate to be located just within Flood Zone C. To provide highly vulnerable and less vulnerable type development within Flood Zone A requires a **Justification Test** to be completed to justify development in this moderate flood risk area.

2.5 Site Specific Flood Risk Assessment for Development

The FRM Guidelines require a SSFRA to "gather relevant information sufficient to identify and assess all sources of flood risk and the impact of drainage from the proposal". It should "quantify the risks and the effects of any necessary mitigation, together with the measures needed or proposed to manage residual risks". It considers the nature of flood hazard, taking account of the presence of any flood risk management measures such as flood protection schemes and how development will reduce the flood risk to acceptable levels. A detailed assessment for a development application should conclude that core flood risk elements of the Justification Test are passed and that residual risks can be successfully managed with no unacceptable impacts on adjacent lands.

2.5.1 SSFRA Key Outputs

Key outputs of an SSFRA are:

- Plans showing the site and development proposals including its relationship with watercourses and structures which may influence local hydraulics;
- Surveys of site levels and comparison of development levels relative to sources of flooding and likely flood water levels;
- Assessments of;
    - Potential sources of flood risk;
    - Existing flood alleviation measures;
    - Potential impact of flooding on the site.
- How the layout and form of the development can reduce those impacts, including arrangements for safe access and egress.
- Proposals for surface water management and sustainable drainage.
- The effectiveness and impact of any mitigation measures.
- The residual risks to the site after the construction of any necessary measures and the means of managing those risks; and
- How flood risks are managed for occupants / employees of the site and its infrastructure.

3 STAGE 1 FLOOD RISK IDENTIFICATION

3.1 Available Flood Risk Information

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

To initially identify potential flood risks for the subject site and surrounding area, a number of available data sources were consulted, these are listed in Table 3.1 below.

Table 3.1 - Review of Available Flood Risk Information

	Information Source	Coverage	Quality	Confidence	Identified Flood Risks	Flood Risk
Primary Data Source & Modelled Data	OPW ECFRAM - Fluvial	Regional	High	High	Flood maps indicates that the development site is marginally in Flood Zone B in the north-western corner.	✓
	OPW ECFRAM - Tidal	Regional	High	High	Tidal Flooding Map identifies site to be outside of the indicated 0.5% AEP event coastal flood zone.	X
	ICPSS	Nationwide	High	High	ICPSS maps indicate that the subject site is outside the tidal floodplain for the 0.5% AEP, although protected by defences.	X
	SDCC Development Plan SFRA	Local	High	High	Flood maps indicates that the development site is marginally in Flood Zone B in the north-western corner.	✓
Secondary Data Source	Walkover Survey	Local	Varies	Varies	No evidence of flooding. All drainage is underground. Levels within the site fall from south to north.	X
	OPW Historic Flood Records	Nationwide	Varies	Varies	No records of flooding on site. Flooding of the Owendower has occurred in 2000 and 1994	X
	Historic OSI Maps	Nationwide	Moderate	Low	None.	X
	EPA Ex. Rivers	Nationwide	Moderate	Moderate	No designated River / Stream in site.	X
	Drainage Records	County	Moderate	Moderate	No Irish Water drainage assets running through site.	X
	Geological Survey Ireland Maps	Nationwide	Moderate	Low	Cohesive and granular deposits (CLAY and SAND). No groundwater encountered.	X

	Topographic Survey	Local	High	High	Site relatively flat with slight fall from south to north. Levels range from 76m AOD to 79m AOD.	X

3.2 Identified Flood Risks/Flood Sources

3.2.1 OPW Predictive, Historic & Benefiting Lands Maps & Flood Hazard Information

From consultation of flood information from the OPW's floodmaps.ie website the site has not suffered from flooding in the past. A review of this report shows that there have been 19 flood events recorded within 2.5km of the site since 1905. However, there are no records of the site itself having been flooded. Nevertheless, there was a significant flooding from the Owendoher adjacent to the site, in 2000 and 1993.

Fluvial Flood Risk

The OPW's Eastern CFRAM study produced flood risk maps and the assessment of fluvial flood plains over the eastern region of Ireland. As part of this study both the Owendoher and Whitechurch were assessed, of which the site falls between these two watercourses. The subject site is considerably closer to the Owendoher and only the north-western portion of the site falls within the flood extents of the Owendoher's flood extents and even then, is only within Flood zone B, as can be seen in figure 3.1.

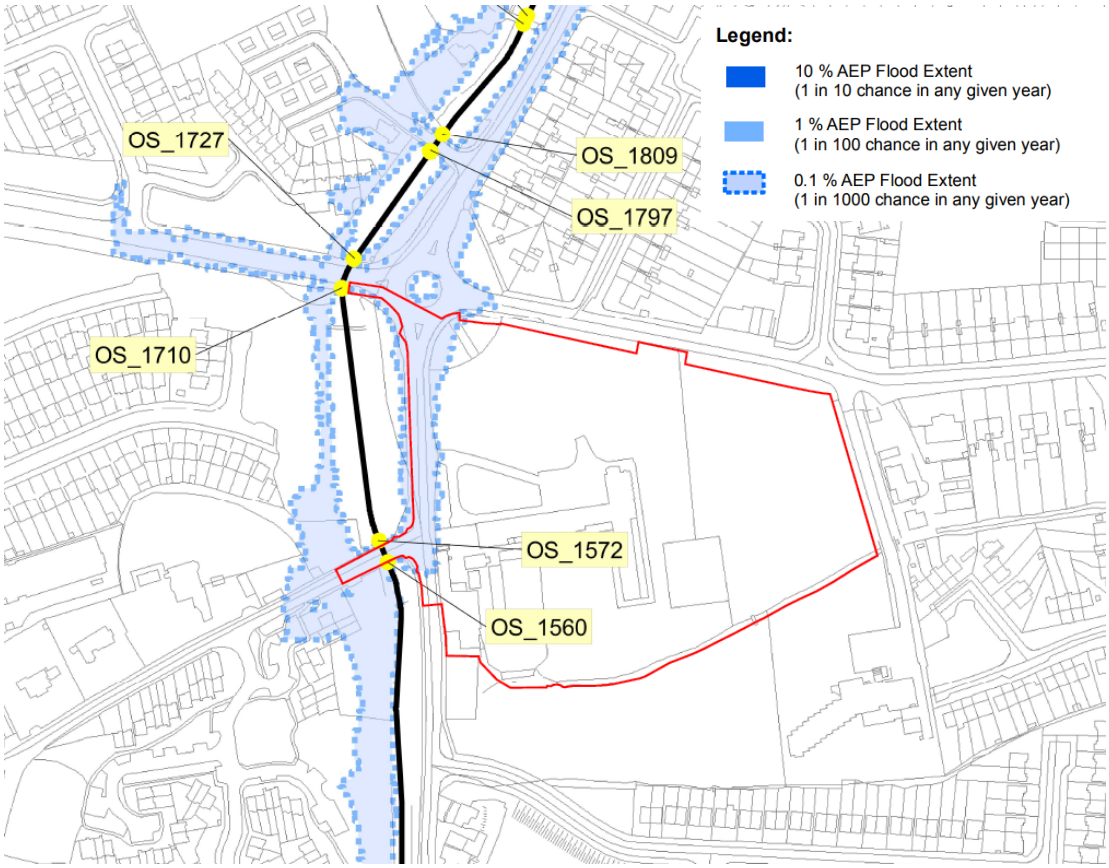


Figure 3-1 Extent of Fluvial Flood Risk (extract from CFRAMs Dodder Catchment Flood Extents) (Boundary Indicative)

Tidal Flood Risk

The subject site is 7.5km from the coast and at an approximate level of 76m AOD and not affected by tidally influenced waters. The OPW ECFRAM coastal flood risk analysis for the 0.5% and the 0.1% AEP return periods do not cover these areas within their mapping due to the distance of the subject site from the coast.

3.2.2 South Dublin County Council Strategic Flood Risk Assessment

South Dublin County Council's Strategic Flood Risk Assessment (SFRA) which uses the draft ECFRAM mapping as its basis for identifying areas at flood risk. The SFRA identifies the subject site as partially within Flood Zone B as per the ECFRAM mapping (See *Figure 3-2*) with the remainder of the site in Flood Zone C (low risk). It should be noted that the mapping in *Figure 3-2* has very similar colour shading. The figure shows that the full site extents are located within the riparian corridor and not Flood Zone B.

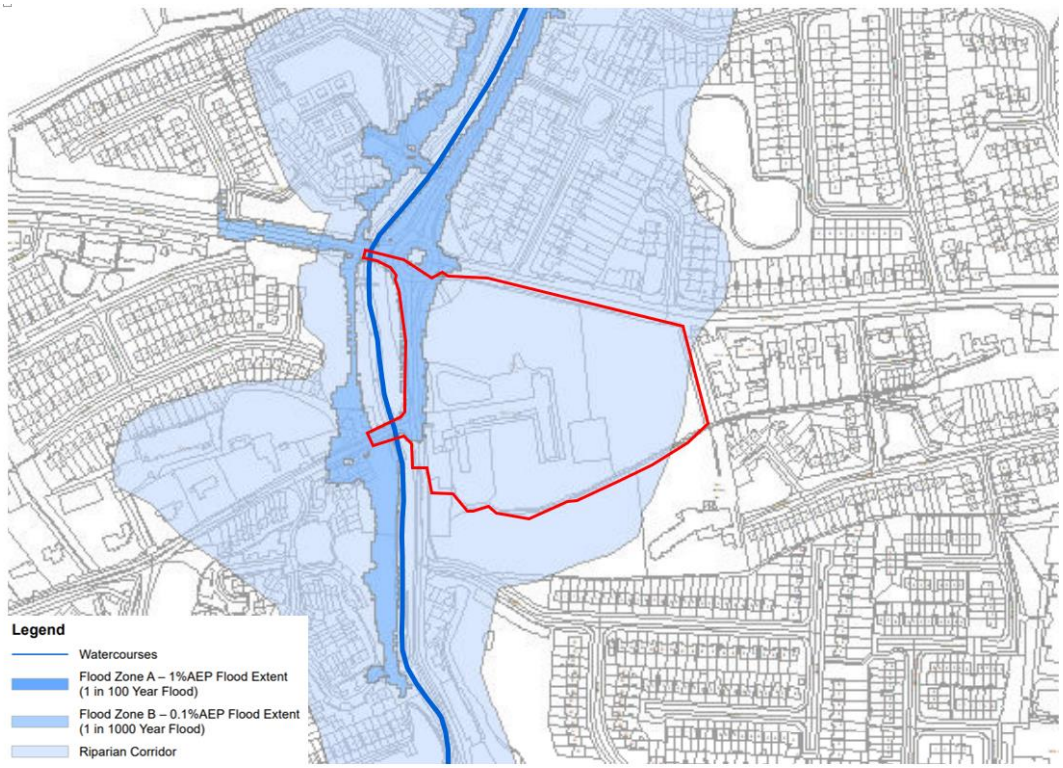


Figure 3-2 Extract from SDCC Strategic Flood Risk Assessment, Development Plan 2022-2028, Estimated Flood Extents (Boundary Indicative)

3.2.3 Irish Coastal Protection Strategy Study (ICPSS)

After reviewing the ICPSS coastal flood extents maps, it can be seen that the subject site is not within the modelled flood extent for the 0.5%AEP event. As per section 3.2.3, the site is several kilometres from the coast and 70+m above sea level. Therefore, the development site is not located on the ICPSS flood extent maps and the risk of tidal flooding can be classified as extremely low.

3.2.4 Topographical Survey

After reviewing the Topographical survey, the subject site is relatively level with a gentle slope occurring from north to south. The survey indicates existing highest ground levels of 80m AOD in the south-western and southern eastern parts of the site.

The existing access into the site is circa 400mm higher than Edmondstown Road, which ties in to the predicative ECFRAMS flood extents mapping.

3.2.5 Walkover Survey

From a walkover survey, the site is currently unoccupied and consists of the main Good Counsel building and associated maintenance buildings. The subject site is relatively flat, and no evidence of flooding or flow paths are evident on site. The walkover survey confirmed the proposed development site is as expected and ties in with the topographical survey.

3.2.6 Other Sources

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

- Site Investigation – No groundwater encountered in site investigation
- Groundwater information from GSI – There are no records of any karst features in the locality and there is no record of evidence of groundwater flooding for the proposed site.
- Groundwater information from OPW's Draft Preliminary Flood Risk Assessment – The flood risk map indicates no groundwater flood risk to the site or to the surrounding area.
- Existing Local Authority Drainage Records – The surrounding area predominately uses separated foul and surface water sewers, with the majority of surface water from the surrounding area discharging into the Owendoher River. To the west of the development an existing 225mm diameter foul sewer services the site which runs along Edmondstown Road from south to north towards Ballyboden Road.

  The proposed site is also serviced by an existing surface water sewer located to the west of the site which directly crosses Edmondstown Road discharging into the Owendoher River.
- Historic Maps – The mill race can be seen along the south of the site on the Historic 6-inch colour (1827-1842) in Figure 3.3. No signs of flooding or marshland are apparent.

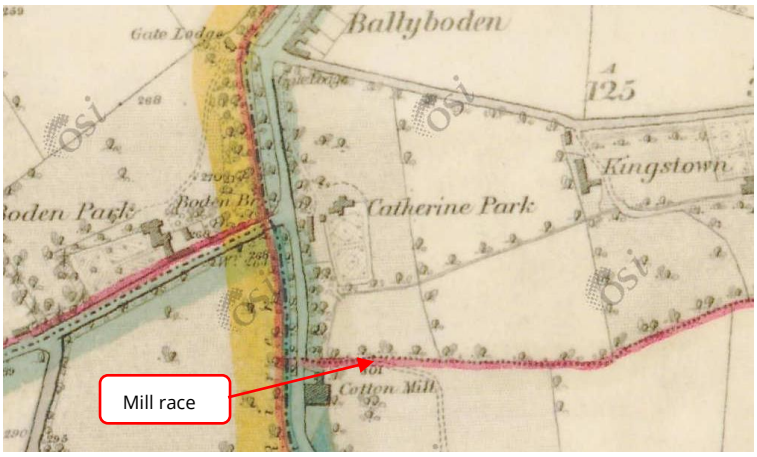


Figure 3-3 6-Inch historical OSI map showing mill race

3.3 Source-Pathway-Receptor Model

A Source-Pathway-Receptor model was produced to summarise the possible sources of floodwater, the people, and assets (receptors) that could be affected by potential flooding (with specific reference to the proposals), see Table 3.2. It provides the probability and magnitude

No other Local Authority drainage infrastructure appears to exist in the vicinity of the site.

Of the sources, the performance and response of pathways and the consequences to the receptors in the context of the mixed-use development proposal. These sources, pathways and receptors will be assessed further in the initial flood risk assessment stage.

Source	Pathway	Receptor	Likelihood	Impact	Risk
Tidal	Subject site is several kilometres from the coast at 70m+ above sea level.	-	Very remote	-	-
Fluvial	Majority of proposed development site within Flood Zone C (low risk of fluvial flooding) with only the northwest corner encroaching marginally on Flood Zone B.	Future Development	Remote	Medium	Medium/Low
Surface Water Drainage (Pluvial)	Flooding from the surcharging of the development's drainage systems.	Future development	Possible	Low	Low
Groundwater flooding	Rising GWL on the site	Future development	Very Remote	-	-
Infrastructural - Human or Mechanical Error	Blockage of new drainage network.	Areas of development draining to the surface water network	Possible	Low	Low

Table 3.2 Source-Pathway-Receptor Analysis

The following paragraph provides a summary of the results of this Source-Pathway-Receptor flooding model for the subject site.

3.4 Source-Pathway-Receptor Model Results

As it can be seen in the above flooding analysis, the proposed development site is at a low to medium risk from fluvial flooding.

There is also a low risk of pluvial flooding due to the potential surcharging and blockage of the new drainage network.

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

4 STAGE 2 INITIAL FLOOD RISK ASSESSMENT STAGE

The main sources of flood risk identified from Stage 1 are:

- A low pluvial flood risk associated with the proposed developments proposed drainage network.
- A low to moderate risk of fluvial flooding associated with Owendoher River in the 0.1% AEP.

4.1 Initial Fluvial Flood Risk Assessment

As stated above, the north-western corner of the site is within Flood Zone B and susceptible to flooding in the 0.1% AEP flood event. The remainder and majority of the site is thus in Flood Zone C (low risk)

From reviewing the CFRAMS maps and SFRA maps, it seems the predictive flooding does not occur from the river itself but from the corresponding surface water sewers/streams that occurs when reaching the bridge structure of the Scholarstown Road and structures further downstream. An overland flow path then develops at the junction of Scholarstown Road and Edmondstown Road and travels down Edmondstown road to the roundabout of Taylors Lane and Ballyboden Road. This is the location where the flood extents are marginally located within the subject site, refer to figure 4.1.

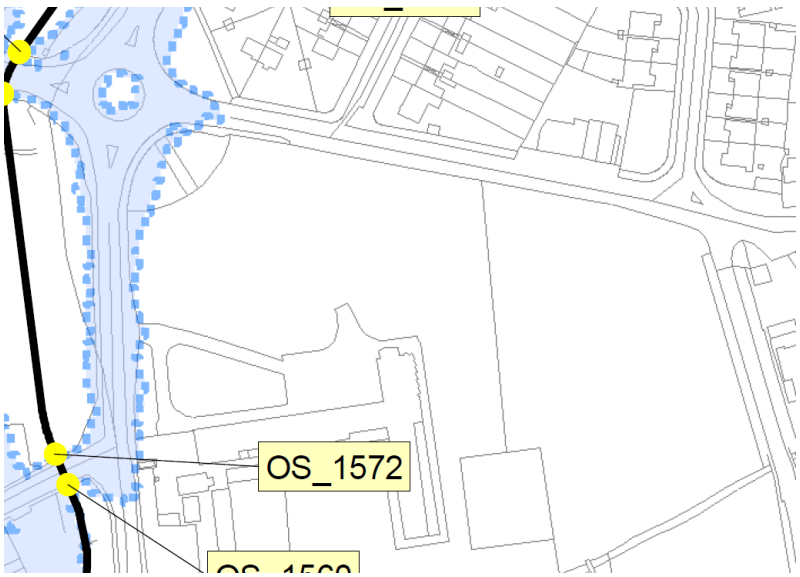


Figure 4-1 Extract from CFRAMs Dodder Catchment Flood Extents

On further review of the CFRAMs information, the depth of fluvial flooding is noted at only 250mm or less within the site itself, meaning that any flooding occurring in this location in the 0.1%AEP is relatively minor.

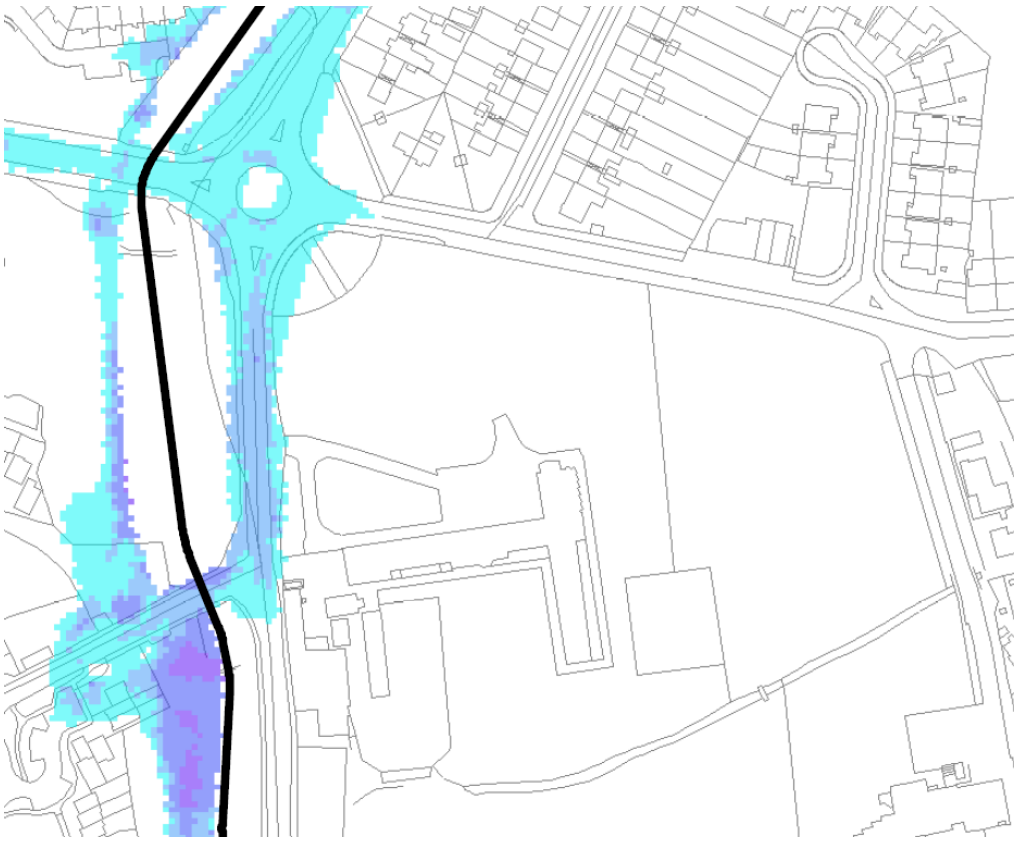


Figure 4-2 Extract from CFRAMs Dodder Catchment Flood depths

4.2 Initial Pluvial Flood Risk Assessment

The Source-Pathway-Receptor model identified that there could be potential for pluvial flood risk within the development site related to the future drainage networks serving the proposed development.

These have potential to cause local flooding unless they are designed in accordance with the regulations e.g., GDSDS and to take account of flood exceedance e.g., for storms return periods over 1% AEP. However, this is not an issue for the subject development as the proposed drainage system has been designed in accordance with current requirements of the GDSDS (i.e., 2-year, 30 year no flooding on site & check at 100-year for surcharging, storage, flood routing & freeboard to FFLs).

Pluvial flood risk associated with the proposed development has been addressed in detail within DBFL Infrastructure Design Report 190068-X-05-X-XXX-RP-DBFL-CE-0002. The pluvial risk has been mitigated for the proposed via:

- New drainage collection system incorporating SUDS features.
- Surface water network capacity to be designed in accordance with GDSDS recommendations and SDCC requirements and incorporate 20% climate change.
- Existing runoff rates will be reduced by the provision of a co-ordinated surface water network incorporating SUDS elements at different stages with attenuated outlet ("hydrobrake optimum" or similar approved as a flow control device). This is designed to restrict discharges to 2l/s per hectare of contributing catchment.
- An adequately sized attenuation facility to cater for retained flood volumes. This is designed for the 1 in 100-year storm plus 10% allowance for climate change.

Proper operation and maintenance of the drainage system should also be implemented in accordance with the CIRIA 753, The SUDS Manual, to reduce the risk of human or mechanical error causing pluvial flood risk from blockages, etc.

4.3 Flood Zone Category

Following the assessment of the flood risk to the site and the available information it is considered that the majority of the proposed development site is located within Flood Zone C and only a portion of the subject site in the north-western corner is located in the 0.1% AEP flood extent form the Owendoher River, which classifies this area of the site as being in Flood Zone B.

The pluvial flood risk was originally assessed as low, and the measures of a SUDS strategy and a maintenance regime as detailed in the DBFL's Infrastructure Design Report, the pluvial flood risk to the development is deemed as very low and no further assessment is deemed necessary.

As the proposed development is located within flood zone B, this document will further assess the fluvial vulnerability and viability of the proposed development in regard to this source of flooding.

5 STAGE 3 DETAILED FLOOD RISK ASSESSMENT

The detailed Flood Risk assessment stage will look more closely how the proposed development will mitigate flood risk from the identified source.

In regard to the identified fluvial flood risk, the detailed flood risk assessment stage will assess this in relation to the following;

- Proposed development plans (FFLs, site vulnerability, building extents).
- Impact of proposed development on adjacent properties.
- In relation to the objectives set out in the SDCC SFRA justification test.
- Any residual risks
- Flood exceedance.

5.1 Detailed Fluvial Flood Risk Assessment

As stated in section 1.5, the proposed development is to construct a residential development arranged in five blocks ranging from 2-5 storeys with associated courtyard and landscaping and basement.

The initial flood risk assessment assessed the risk associated with the 1 in 1000-year fluvial flood event from the Owendoher River as the principle source of the flooding on the site.

As the development for the site is proposing a residential nature, such developments are categorised as 'highly vulnerable' development and appropriate to be located above the appropriate flood level (plus freeboard and climate change) in accordance with South Dublin County Councils' Strategic Flood Risk Assessment.

As described in the initial flood risk assessment, it seems the flood extents in the locality of the subject site are due to overland flows from surface water sewers as there seem to be sporadic flood extents at structures and areas where sewers are entering the watercourse.

Adjacent to the site at the junction with Scholarstown Road, the junction crosses the Owendower River, at this point, it seems an overland flow develops from surcharging watercourses.

Figure 5-1 Existing levels in the vicinity of the proposed development site

According to the SDCC SFRA, the minimum finished floor level for a 'highly vulnerable' development should be a 'suitable freeboard' above the 0.1% AEP fluvial event level, with a suitable allowance being noted as 500mm.

As is apparent from the CFRAMs flood maps, the river level is not contributing to the flooding in this instance and therefore no modelled flood level can be obtained from the river nodes.

Therefore, the flood depth maps will be used to assess the development proposals against the risk of flooding.

In figure 5.1, the existing ground levels have been noted in the north-western corner of the subject site, where the flood extents extend too (as can be seen in figure 5.2).

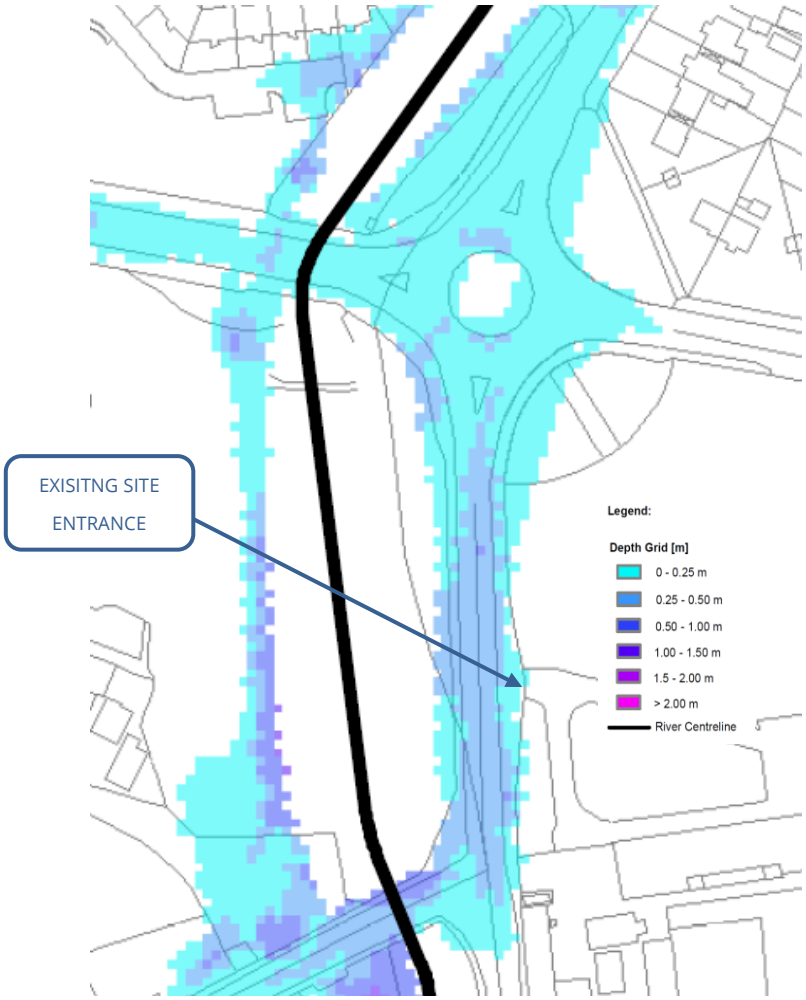


Figure 5-2 CFRAM Flood depths in north-western corner of the subject site.

From figure 5.1, the back of footpath levels (edge of flood extents) ranges from 77.01m at the existing site entrance to 75.14m at the roundabout.

The proposed development has been designed to ensure there is no detrimental effect on flood risk for the development or any other users. At this point it should be noted the development lands have a trunk watermain that runs through the development which will include an 8m wayleave (from either side of the sewer) which will effectively sterilise this portion of development land. Therefore, the development has been designed with a separation distance from the water main and therefore the proposals have been pushed away from the north-western corner of the site.

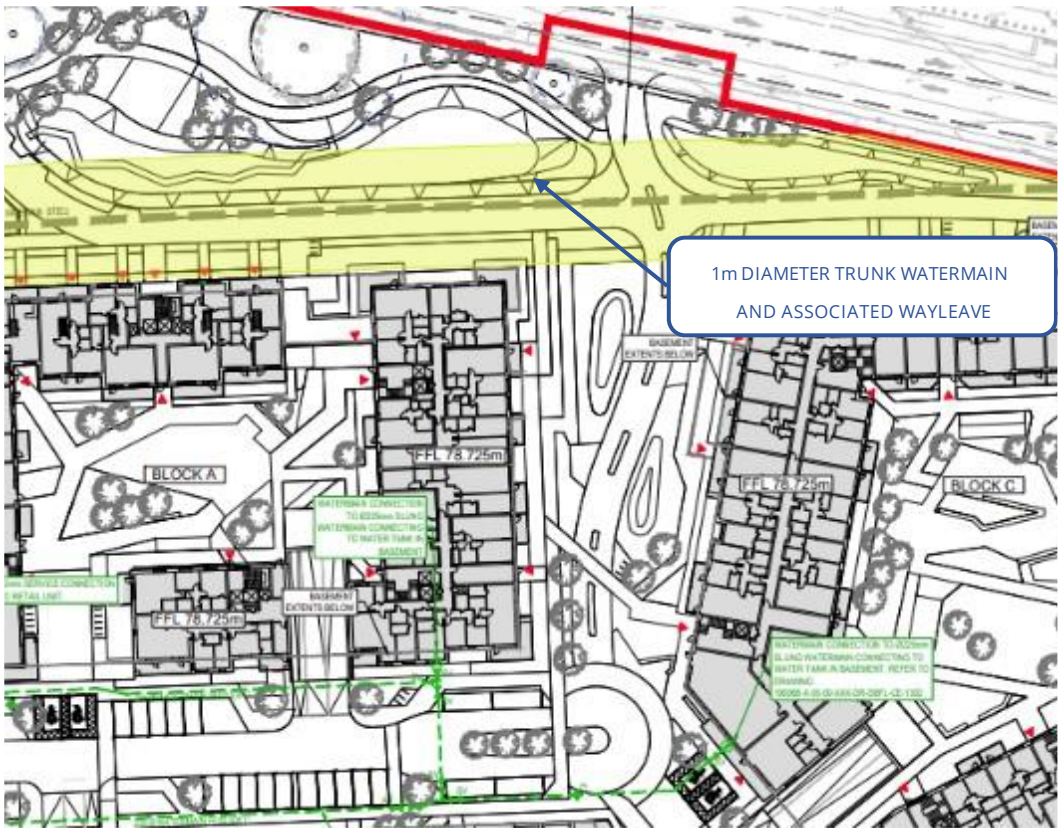


Figure 5-3 Development Proposals showing Watermain constraint.

The site's proposed ground finished floor levels have been determined from existing levels and the blocks have been stepped to these existing levels and minimise basement excavation. The FFL's of the western buildings of Block A and B have been designed to give the required 500mm freeboard above the deign flood level (which has been taken as back of existing footpath level).

To fully assess the development proposals, the CFRAMs flood extents were overlaid to ensure all development is wholly located within Flood zone C (figure 5.4).

As a conservative approach, a bund or raised levels along the western side of the development will be created in the landscaping, to ensure there is a 500mm freeboard between the extents of flood zone B and the proposed development.

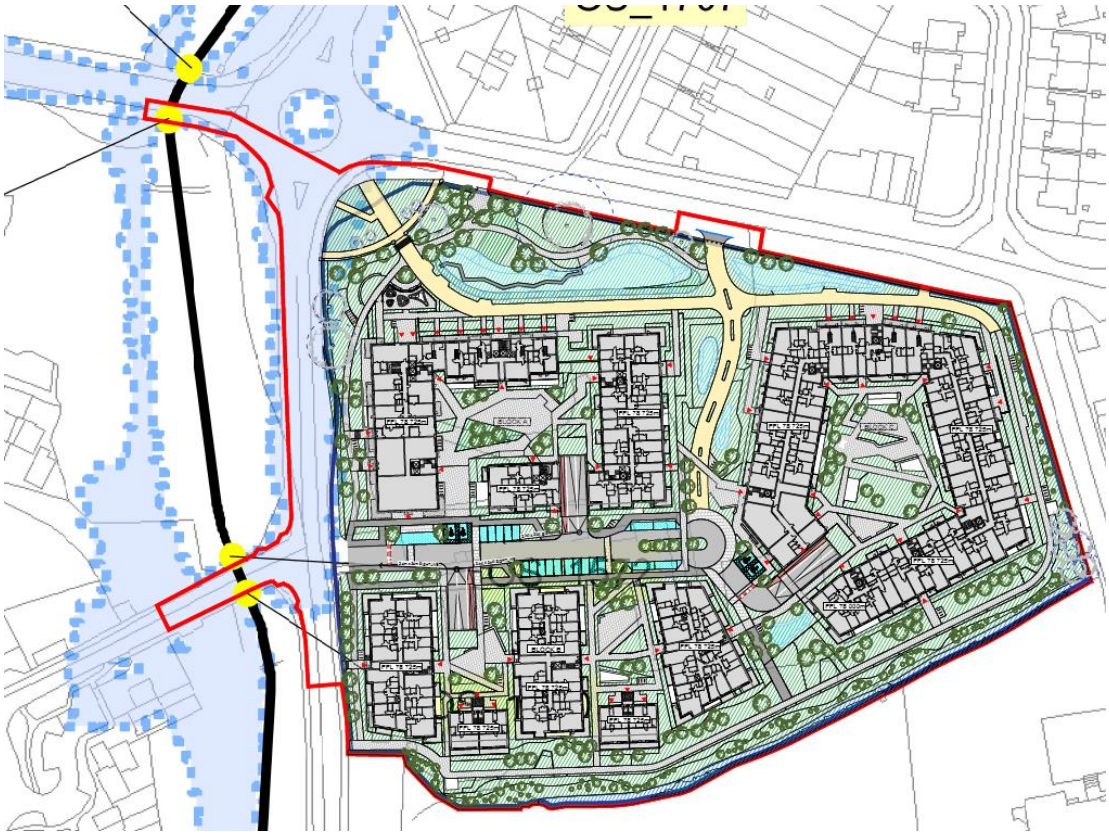


Figure 5-4 Development Proposals with overlaid CFRAMS Mapping

Although, due to the step-in level as described previously, there a few own door units to the north of Block A that are only located 400mm higher than the design flood level. In this instance the 500mm freeboard is still achieved due to the existing levels of the site, ref to fig 5.5.

Figure 5-5 Development Proposals with overlaid CFRAMS Mapping showing levels

As can be seen, the existing level at the north-western entrance is in exceedance of 500mm freeboard, ensuring no flood flow routes can enter the site. With the proposed landscaping to the western boundary and the existing levels at this entrance, both Block A & B are fully protected in regard to flood risk from this source.

5.2 Residual Risks

Remaining residual flood risk, following the initial assessment include the following;

- Pluvial flooding from the drainage system related to blockage.
- Pluvial flooding from the development's drainage system in the exceedance event (> 1% AEP event.)

5.3 Mitigation Measures

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

- The proposed drainage system to be maintained on a regular basis to reduce the risk of a blockage.

- In the event of storms exceeding the 100-year design capacity of the drainage system, then possible flood routing for overland flows towards Edmondstown Road and Taylors Lane should not be blocked.

5.3.1 Effectiveness of Mitigation Measures

It is considered that the flood risk mitigation measures once fully implemented are sufficient to provide a suitable level of protection to the proposed development.

The proposed development will not increase the run-off rates when compared with the existing site and satisfies the requirement of the SFRA to reduce flooding and improve water quality.

5.4 Flood Exceedance

In the case that that an exceedance storm event occurs, in excess of the 1% AEP. The development's layout is designed to ensure over-land flows are directed away from the buildings. In larger than the 100-year storm events, there will be additional volume within the surface water network which will be able to surcharge before flooding. When this tolerance has been exceeded the attenuation storage features will flood and overtop, with overland flows expected to pass from the site onto Taylors Lane/Edmondstown Road following the topography of the land (refer to figure 5.6).

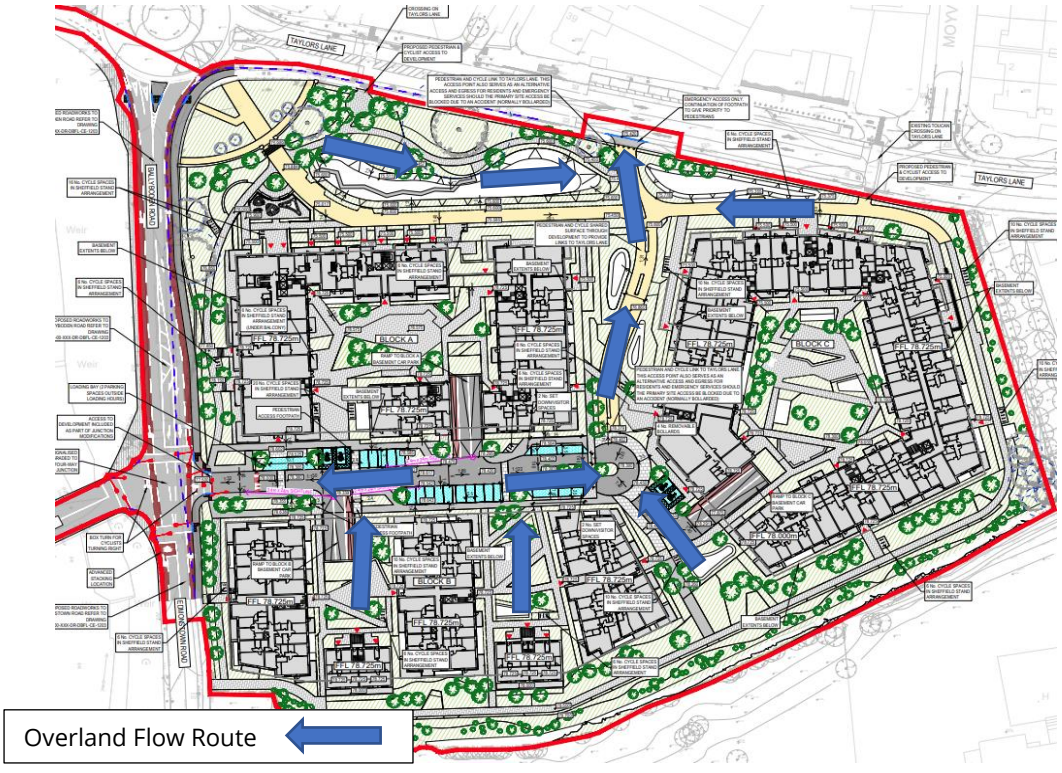


Figure 5-6 Overland flow route in exceedance event

6 HYDROMORPHOLOGICAL ASSESSMENT

6.1 Context

It is stated in the South Dublin Development Plan 2022-2028 Strategic Flood Risk Assessment, chapter 6 that any proposed development within a Riparian Zone requires a Hydromorphological assessment.

It can be seen in Figure 6.1 the extents of the development is largely in the Riparian zone of the Owendoher.

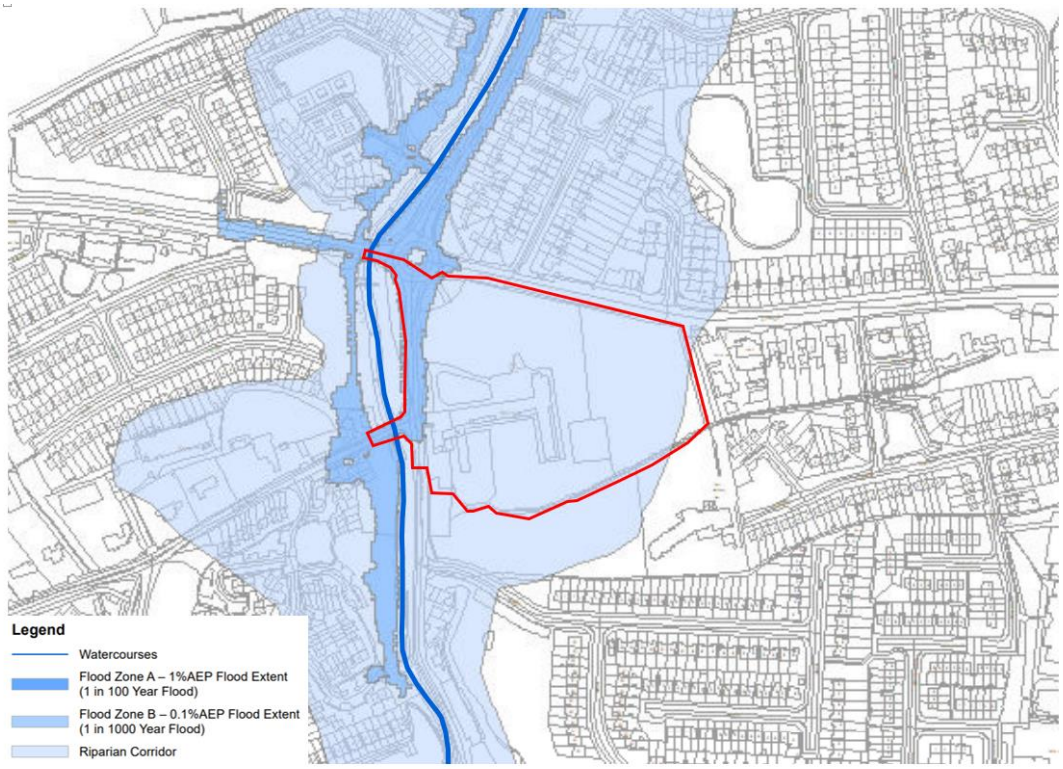


Figure 6-1 Development area in Context with the Identified Riparian Zone (Boundary indicative)

As can be seen from the development proposals, the subject site is segregated from Owendoher River by Edmonstown Road to the west and Ballyboden to the north. Therefore this hydromorpological assessment will concentrate on SuDS measures as per the SDCC SFRA.

"Where proposed development lands are within the Riparian Corridor but are not directly adjacent to a watercourse, measures should focus on SuDS to manage the quality and quantity of surface water runoff and promote biodiversity."

6.2 Key Assessment Criteria

As per the SDCC SFRA 5 key assessment parameters shall be considered, although it should be noted (as previously stated) that the subject site is not directly adjacent Owendoher River.

6.2.1 Flow

The development proposals will not affect the flow of the river due to the proximity of the development site to the watercourse. The surface water outfall to the site does discharge to the Owendoher River although this can be considered a betterment over the existing scenario as the proposed development will include a treatment train and several stages of SuDS, only discharging greenfield run-off rates to the river in significant design events. The majority of smaller rainfall events will be intercepted on site via the various SuDS elements.

6.2.2 River Continuity

River continuity will not be altered due to the development proposals, as the subject site is not directly adjacent to the watercourse.

6.2.3 Planform

The planform of the Owendoher River will not be altered due to the development proposals, as the subject site is not directly adjacent to the watercourse.

6.2.4 Sediment Regime

The sediment regime of the Owendoher River will not be altered due to the development proposals, as the subject site is not directly adjacent to the watercourse. The only source of any potential sediment change would be from the outfall, in which all drainage from the development will pass through multiple SuDS features, to ensure any silt is minimised. It is therefore deemed the development proposals affect on Sediment Regime will be negligible.

6.2.5 Riparian Vegetation

The Riparian of the Owendoher River will not be altered due to the development proposals, as the subject site is not directly adjacent to the watercourse. The landscape proposals for the development have been detailed in this application and will be of a huge benefit in regard to biodiversity.

6.2.6 SuDS

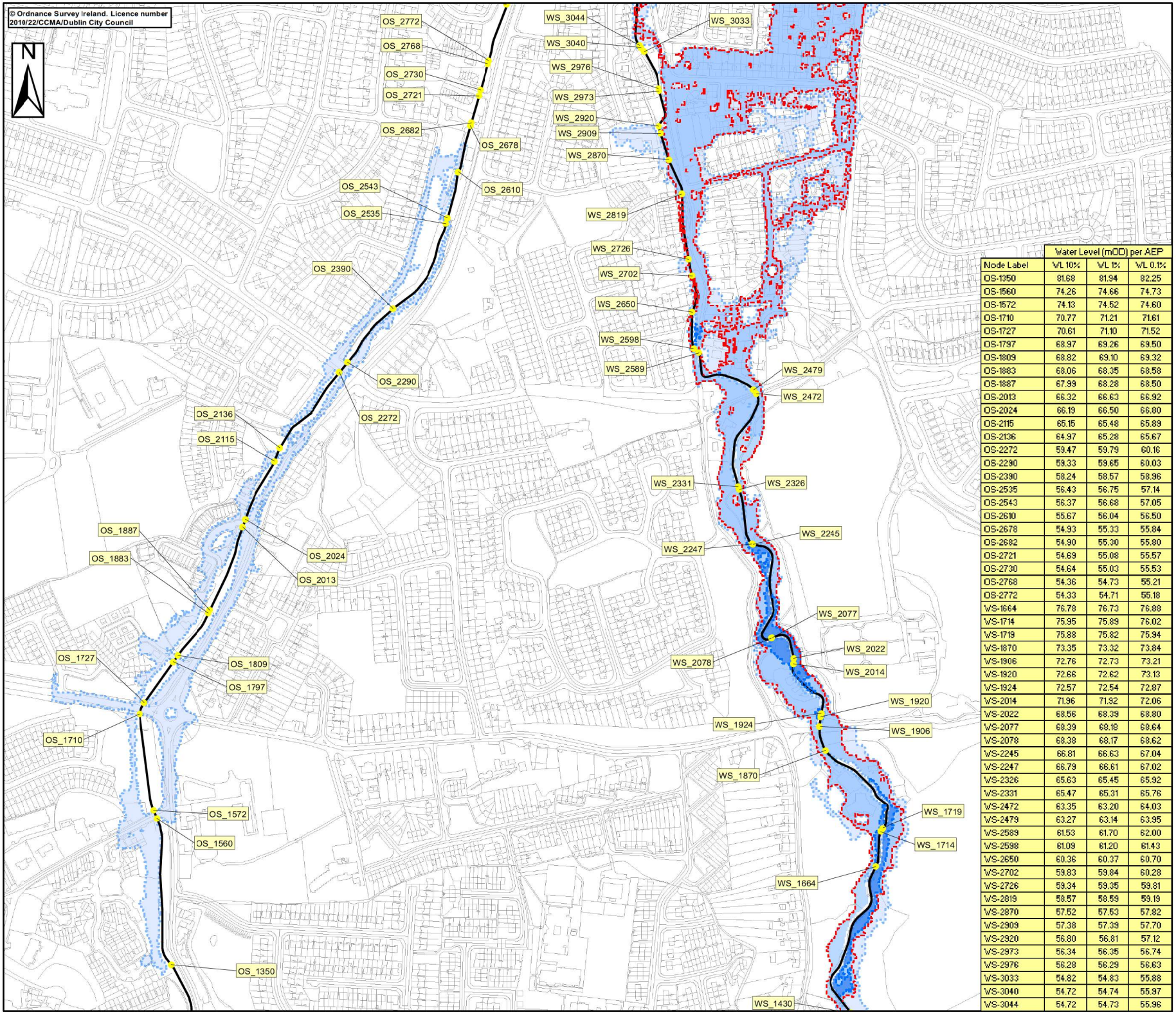
As previously stated the subject site is not directly adjacent to the Owendoher River and therefore the assessment will concentrate on the proposed SuDS measures in place. DBFL's infrastructure design report outlines all SuDS measures and the associated treatment train for the development

and includes, bio-retention areas, permeable paving, detention basins, conveyance swales, proprietary arched attenuation systems, rain gardens and tree pits.

7 CONCLUSION

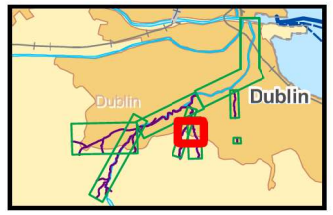
- The SSFRA concludes the following;
- This Site-Specific Flood Risk Assessment for the proposed residential development at Taylor's Lane was undertaken in accordance with the requirements of the "Planning System and Flood Risk Management Guidelines for Planning Authorities", November 2009.
- The proposed type of development for this site is to be residential and is categorised as ***highly vulnerable development***.
- All Highly vulnerable development is located wholly in Flood Zone C.
- Only the north-western corner of the subject site is located in Flood Zone B and due to the infrastructure constraints (watermain wayleave), all proposed development is located well outside Flood Zone B.
- As part of the mitigation measures to reduce the associated Flood risk for site users, was by ensuring all 'highly vulnerable' finished floor levels are located above the 0.1% AEP flood level plus 500mm freeboard. As the flood extents relate to overland flows, the CFRAMS flood depth maps and site-specific topographical survey were used to calculate the levels at the flood extents. Where the difference between the calculated flood level and the FFL is not 500mm, landscaping will ensure the 500mm freeboard is included to ensure no further overland flow paths are created within the site.
- A possible source of flood risk from the surcharging or blockage of the development's drainage system has been identified. This risk is mitigated by suitable design of the drainage network (as detailed in DBFL Infrastructure Design Report 190068-X-05-X-XXX-RP-DBFL-CE-0002), regular maintenance and inspection of the network and establishment of exceedance overland flow routes.
- The development's drainage design includes for a 20% climate change allowance.
- The proposed development will not increase run-off rate when compared with the existing site and satisfies the requirement of the SFRA to reduce flooding and improve water quality.

Appendix A : OPW Flood Hazard Report



Node Label	Water Level (mOD) per AEP		
	WL 10%	WL 1%	WL 0.1%
OS-1350	81.68	81.94	82.25
OS-1560	74.26	74.66	74.73
OS-1572	74.13	74.52	74.60
OS-1710	70.77	71.21	71.61
OS-1727	70.61	71.10	71.52
OS-1797	68.97	69.26	69.50
OS-1809	68.82	69.10	69.32
OS-1883	68.06	68.35	68.58
OS-1887	67.99	68.28	68.50
OS-2013	66.32	66.63	66.92
OS-2024	66.19	66.50	66.80
OS-2115	65.15	65.48	65.89
OS-2136	64.97	65.28	65.67
OS-2272	59.47	59.79	60.16
OS-2290	59.33	59.65	60.03
OS-2390	58.24	58.57	58.96
OS-2535	56.43	56.75	57.14
OS-2543	56.37	56.68	57.05
OS-2610	55.67	56.04	56.50
OS-2678	54.93	55.33	55.84
OS-2682	54.90	55.30	55.80
OS-2721	54.69	55.08	55.57
OS-2730	54.64	55.03	55.53
OS-2768	54.36	54.73	55.21
OS-2772	54.33	54.71	55.18
WS-1664	76.78	76.73	76.88
WS-1714	75.95	75.89	76.02
WS-1719	75.88	75.82	75.94
WS-1870	73.35	73.32	73.84
WS-1906	72.76	72.73	73.21
WS-1920	72.66	72.62	73.13
WS-1924	72.57	72.54	72.87
WS-2014	71.96	71.92	72.06
WS-2022	68.56	68.39	68.80
WS-2077	68.39	68.18	68.64
WS-2078	68.38	68.17	68.62
WS-2245	66.81	66.63	67.04
WS-2247	66.79	66.61	67.02
WS-2326	65.63	65.45	65.92
WS-2331	65.47	65.31	65.76
WS-2472	63.35	63.20	64.03
WS-2479	63.27	63.14	63.95
WS-2589	61.53	61.70	62.00
WS-2598	61.09	61.20	61.43
WS-2650	60.36	60.37	60.70
WS-2702	59.83	59.84	60.28
WS-2726	59.34	59.35	59.81
WS-2819	58.57	58.59	59.19
WS-2870	57.52	57.53	57.82
WS-2909	57.38	57.39	57.70
WS-2920	56.80	56.81	57.12
WS-2973	56.34	56.35	56.74
WS-2976	56.28	56.29	56.63
WS-3033	54.82	54.83	55.88
WS-3040	54.72	54.74	55.97
WS-3044	54.72	54.73	55.96

Location Plan:



Legend:

- 10 % AEP Flood Extent (1 in 10 chance in any given year)
- 1 % AEP Flood Extent (1 in 100 chance in any given year)
- 0.1 % AEP Flood Extent (1 in 1000 chance in any given year)
- Defended Area
- High Confidence (<20m) (10% AEP)
- Medium Confidence (<40m) (10% AEP)
- Low Confidence (>40m) (10% and 0.1% AEP)
- High Confidence (<20m) (1% AEP)
- Medium Confidence (<40m) (1% AEP)
- Lcw Confidence (>40m) (1% AEP)
- River Centreline
- Node Point
- OS_2975 Node Label (refer to table)
- Flow reporting location
- 10% Flow = 1.20, 1% Flow = 1.56, 0.1% Flow = 2.17 Peak flow during design flood extent

USER NOTE:

USERS OF THESE MAPS SHOULD REFER TO THE DETAILED DESCRIPTION OF THEIR DERIVATION, LIMITATIONS IN ACCURACY AND GUIDANCE AND CONDITIONS OF USE PROVIDED AT THE FRONT OF THIS BOUND VOLUME. IF THIS MAP DOES NOT FORM PART OF BOUND VOLUME, IT SHOULD NOT BE USED FOR ANY PURPOSE.

Client:

Dublin City Baile Átha Cliath · South Dublin County Council · Dún Laoghaire-Rathdown County Council Comhairle Contae Dhún Laoghaire-Ráthdown · OPW

Project:

DODDER CATCHMENT FLOOD RISK ASSESSMENT AND MANAGEMENT STUDY

Map:

PRESENT DAY OWENDOHER & WHITECHURCH

Map Type: FLOOD EXTENT
Source: FLUVIAL FLOODING
Map Area: URBAN AREA
Scenario: CURRENT
Drawn By : A.A.B Date : 26 November 2010
Checked By : A.J. Date : 26 November 2010
Approved By : A.G.B Date : 26 November 2010

Figure No. :

OSWS/EXT/UA/CURS/103

Map Series : Page 2 of 3

Drawing Scale : 1: 5,000 Plot Scale : 1:1 @ A3

0 0.1 0.2
Kilometers

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74 BOUCHER ROAD
BELFAST BT12 6RZ
TEL : 028 9066 7914
FAX : 028 9066 8286
www.rpsgroup.com/Ireland

OPW National Flood Hazard Mapping

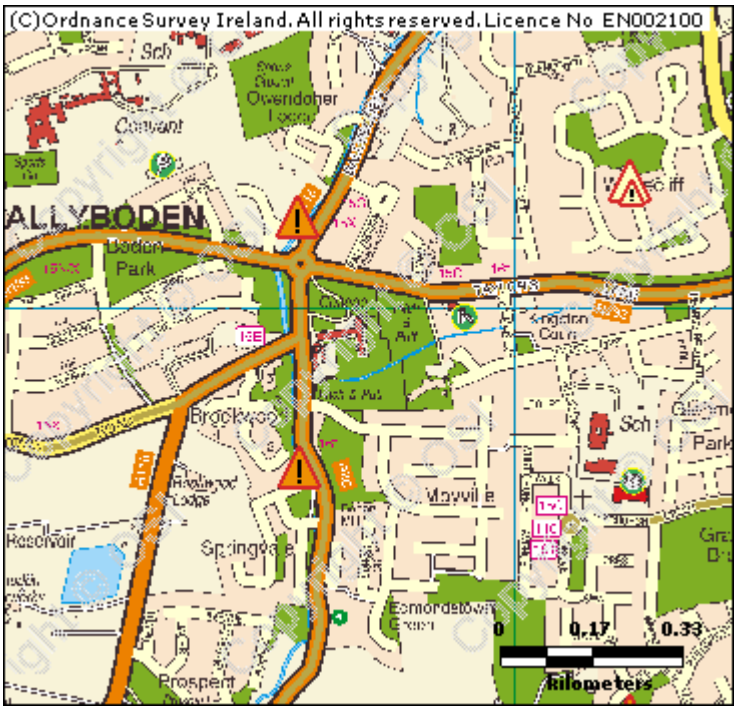
Summary Local Area Report

This Flood Report summarises all flood events within 2.5 kilometres of the map centre.

The map centre is in:

County: Dublin

NGR: O 137 269



Map Scale 1:13,811

Map Legend	
	Flood Points
	Multiple / Recurring Flood Points
	Areas Flooded
	Hydrometric Stations
	Rivers
	Lakes
	River Catchment Areas
	Land Commission *
	Drainage Districts *
	Benefiting Lands *

* Important: These maps do not indicate flood hazard or flood extent. Thier purpose and scope is explained in the Glossary.

19 Results

1. Owendoher River 24th Oct 2011 Willbrook Road
Start Date: 24/Oct/2011
County: Dublin
Flood Quality Code:2
Additional Information: Reports (1) More Mapped Information

2. Dodder Woodview Cottages Rathfarnham Nov 2000
Start Date: 05/Nov/2000
County: Dublin
Flood Quality Code:3
Additional Information: Reports (1) Press Archive (3) More Mapped Information

3. Little Dargle Grange Road Nov 1982
Start Date: 07/Nov/1982
County: Dublin
Flood Quality Code:3
Additional Information: Reports (1) More Mapped Information

4. Little Dargle Sept 1957
Start Date: 24/Sep/1957
County: Dublin
Flood Quality Code:3
Additional Information: Reports (3) More Mapped Information

5. Flooding at Homeville, Knocklyon, Dublin 16.on 24th Oct 2011
Start Date: 24/Oct/2011
County: Dublin
Flood Quality Code:2

Additional Information: Reports (1) More Mapped Information

---

6. Flooding at Nutgrove Avenue, Rathfarnham, Dublin 14on 24th Oct 2011
County: Dublin
Start Date: 24/Oct/2011
Flood Quality Code:2

Additional Information: Reports (1) More Mapped Information

---

7. Flooding at Church Lane, Rathfarnham, Dublin 14.on 24th Oct 2011
County: Dublin
Start Date: 24/Oct/2011
Flood Quality Code:2

Additional Information: Reports (1) More Mapped Information

---

8. Flooding at Castlefield, Glenvara and Glenlyon, Knocklyon, Dublin 16.on 24th Oct 2011
County: Dublin
Start Date: 24/Oct/2011
Flood Quality Code:2

Additional Information: Reports (1) More Mapped Information

---

9. Grange River Kilmashogue Lane June 2003
County: Dublin
Start Date: 30/Jun/2003
Flood Quality Code:4

Additional Information: Reports (2) More Mapped Information

---

10. Knocklyon Ave Nov 2000
County: Dublin
Start Date: 05/Nov/2000
Flood Quality Code:3

Additional Information: Reports (1) More Mapped Information

---

11. Owenadoher Edmondstown Road. Nov 2000
County: Dublin
Start Date: 05/Nov/2000
Flood Quality Code:3

Additional Information: Reports (2) More Mapped Information

---

12. Old City water Course Spawell House Feb 1994
County: Dublin
Start Date: 03/Feb/1994
Flood Quality Code:3

Additional Information: Reports (1) More Mapped Information

---

13. Barton Drive Ballyboden Feb 1994
County: Dublin
Start Date: 03/Feb/1994
Flood Quality Code:3

Additional Information: Reports (1) More Mapped Information

---

14. Boden Villas Feb 1994
County: Dublin
Start Date: 03/Feb/1994
Flood Quality Code:3

Additional Information: Reports (1) More Mapped Information

---

15. Whitechurch Court Feb 1994
County: Dublin
Start Date: 03/Feb/1994
Flood Quality Code:3

Additional Information: Reports (1) More Mapped Information

---

16. Owendoher Willbrook Road August 1986
County: Dublin
Start Date: 25/Aug/1986
Flood Quality Code:3

Additional Information: Reports (2) Press Archive (1) More Mapped Information

---

17. Willbrook Rathfarnham Dec 1958
County: Dublin
Start Date: 16/Dec/1958
Flood Quality Code:4

Additional Information: Reports (1) More Mapped Information

---

18. Ballyboden Road Whitecliff Recurring
County: Dublin
Start Date:
Flood Quality Code:3

Additional Information: Reports (1) More Mapped Information

19. Manor Rise Recurring

Start Date:

County: Dublin

Flood Quality Code: 4

Additional Information: Reports (2) More Mapped Information

Appendix B : Topographical Survey


Owendoher Haven
Haven
Owendoher
Taylors Court
BALLYBODEN CRESCENT
MOYVILLE LAWN
Glendoher Park
GLENDOHER
PARK
TAYLORS
LANE
Library
KINGSTOWN COUR
PALMER
PARK
PALMER
Owendoher River
Weir
WALNUT VIEW
Brookwood
LARCH DRIVE
Owendoher River
Pitch & Putt Course
CF
UND
UND

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