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**Proposed new house at  
63 Glenbrook Park,  
Rathfarnham, Dublin 14,**

**Engineering Report**

**November 2021**

**Job Ref: 21787**

**Issue 1**

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# 1 Introduction

This report has been prepared for Aoife Tuomey Architects to address the foul & surface water drainage and flood risk assessment for the proposed development works to No.63 Glenbrook Park, Rathfarnham, Dublin 14.

## 1.1 Desk Study/Site Characteristics

The existing site is a corner site containing a two-storey semi-detached residential property. There is a single car entrance. The property is accessed from Glenbrook Park with access to the rear garden only available at the side of the dwelling.



**Figure 1 Site location (Google Maps)**

There are existing public Foul and Surface sewers running along the roads to the front and side of the property on Glenbrook Park falling from south to north. The location of the sewer is indicated on CORA drawing 21787-CORA-C002. A record of the existing drainage has also been included in Appendix A – Existing Drainage Records.

A review of the Office of Public Works records in relation to flooding indicates that there is no history of flooding on the site. A flood risk assessment has been carried out and details are contained in Section 4.

## 2 Proposed Works

The proposed development is for the construction of a new part two-part single storey dwelling to the western side of the existing house. The new dwelling will incorporate a pitched roof at the first-floor level with a flat green roof incorporated to the ground floor.

## 3 Proposed Drainage Scheme

### 3.1 Existing Drainage

The house at No. 68 Glenbrook Park is currently serviced by foul and surface water sewers flowing from south to north along Glenbrook Park.

The existing drainage records show an existing public 225mm foul sewer and a 225mm surface water sewer. There is a 101.6 uPVC mains water pipe running along Glenbrook Park.

Refer to Appendix A for existing public drainage records.

### 3.2 Proposed Scheme

In order to comply with modern drainage standards, it is proposed to drain the foul and surface water generated from the proposed development using new surface and foul subsurface networks.

It is proposed to provide green roofs to the ground floor flat roof sections to reduce the discharge from the site. Additionally, it is proposed to provide permeable paving as a further sustainable system.

The foul sewage generated will flow by gravity via a combination of the new and existing network to reuse the existing outflow foul connection.

### 3.3 Reference Publications used

Code of Practice – Wastewater Treatment and Disposal Systems Serving Single Houses  
(p.e.  $\leq 10$ )  
Greater Dublin Strategic Drainage Study – Volumes 1 to 6  
Greater Dublin Regional Code of Practice for Drainage Works – Version 6.0  
Technical Guidance Documents – Part H  
Recommendations for Site Development Works for Housing Areas

### 3.4 Foul Waste Discharge

The foul sewage generated from the new house is to fall by gravity via new foul pipework to a new saddle connection to the public network on Glenbrook Park. It is proposed to install a new network of 100mm diameter pipes to serve the proposed development.

In order to calculate the volume of foul sewage generated on site, the following calculations have been adopted:

No. of Bed spaces (House):	3
Population Equivalent:	6PE
Wastewater Loading:	225Litres/person/day
<b>Flow Rate:</b>	<b>1350Litres/day</b>

The above discharge volume represents a discharge flow (1 DWF) of approximately 0.01562Litres/second and a design flow (6 DWF) of 0.0937Litres/second which is within the capacity of the proposed 100mm diameter connection installed at a minimum fall of approximately 1:60 which would have an approximate capacity of 7.2Litres/ second. A connection application will be made to Irish Water for the new foul connection.

Details of the proposed network are shown on drawing number 21787-CORA-C001.

### 3.5 Surface Water Discharge

The proposed surface water drainage schemes have been designed in accordance with Greater Dublin Strategic Drainage Study using sustainable drainage systems (SuDS).

The proposed development will incorporate green roofs to reduce the run-off from the roof surfaces. The pitched roof area at first floor level will discharge to the green roofs to allow for filtration of the rainwater before it enters the subsurface network.

The existing hard standing driveway is to be removed and replaced with new separate driveways incorporating permeable paving. All new terrace areas will incorporate permeable paving.

The storm water sewers have been designed using the Modified Rational Method and a storm return period of 2 years in accordance with the recommendations of *"Recommendations for Site Development Works for Housing Areas"*.

Details of the proposed network and surface finishes are shown on drawings number 21787-CORA-C001 & C.002.

### 3.6 Water Main

A new 22mm diameter uPVC water main will be installed to service the property. A new connection will be required to the 101.6 uPVC mains water pipe running along Glenbrook Park. A connection application will be made to Irish Water for the new foul connection.

### 3.7 Sustainable Urban Drainage (SuDS)

The proposed surface water drainage scheme has been designed in accordance with Greater Dublin Strategic Drainage Study using sustainable drainage systems (SuDS). As such a SuDS analysis of the site was carried out using the online tools available on [www.irishsuds.com](http://www.irishsuds.com) as directed by the Local Authority Water, Waste and Environmental services. The SuDS analysis

determined the following options as feasible for the proposed works at 63 Glenbrook Park, Rathfarnham, Dublin 14.

- Permeable Paving
- Green Roofs
- Soakaway
- Water Butts

The SuDs measures to be implemented on site are Green Roofs and Permeable Paving. It should be noted that the restricted nature of the site limited the implementation of soakaways as minimum set back distances will not be met.

**3.1.1 Green Roofs**

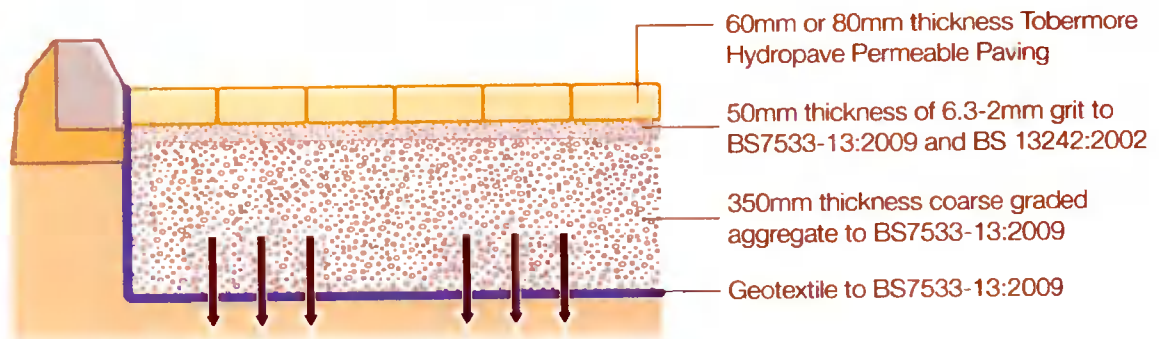
An extensive green roof is proposed for the flat roof surfaces of the new house. The below extract from the Bauder design guide details a typical extensive build up. The green roof will reduce run off from the roof surfaces of up to 25% and will filter all rainfall before discharging to the below ground network.



**Figure 2 Extensive Green Roof**

**3.1.2 Permeable Paving**

It is proposed to install permeable paving to the new driveway and rear terrace of the development. The paving will allow for the reduction in runoff from the new site. The below is an extract from Tobermore paving showing the permeable paving build up. A similar performing product will be used.



**Figure 3 Tobermore Permeable paving extract**

## 4 Flood Risk Assessment

The purpose of the flood risk assessment is to both identify and quantify the potential of flooding of the property from all potential flood risks and/or the effect of the increased flood risk to neighbouring properties. The risk will be quantified on a numerical scale from 1 (Very Low) to 5 (Very High).

The compilation of the following flood risk assessment is based on a desk study compiling information obtained from the Local Authority along with the Office of Public Works (OPW) flood maps and reports.

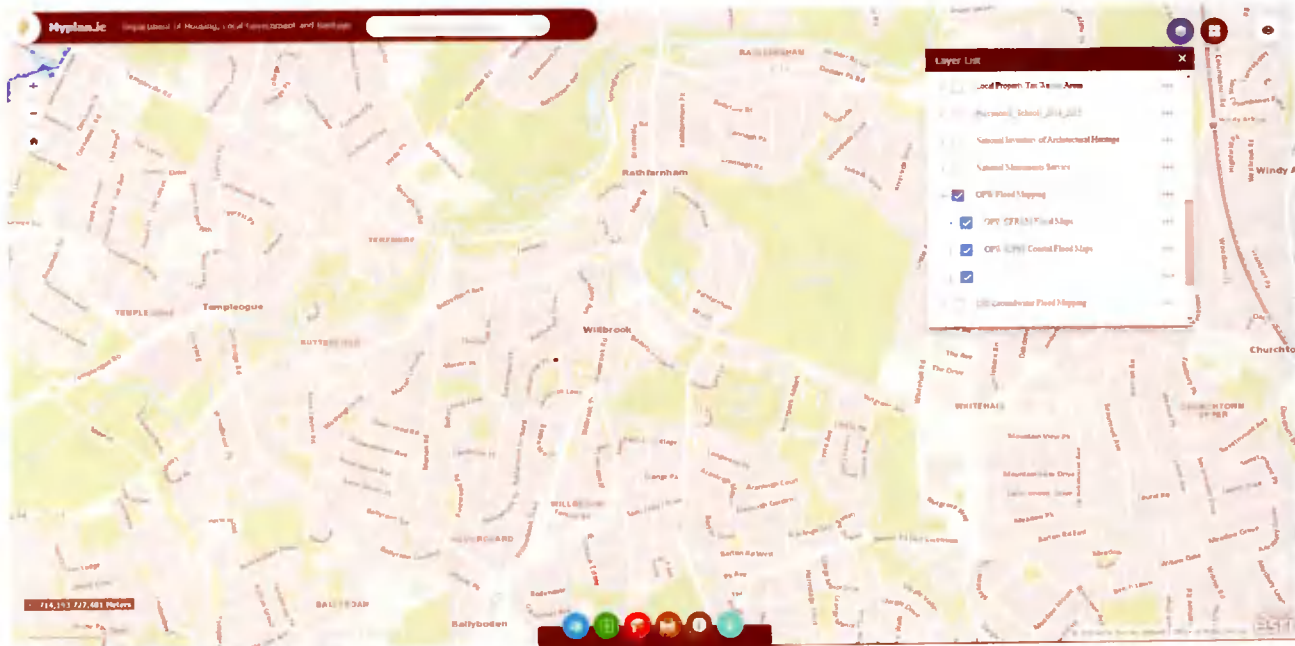


Figure 4 Site location (Myplan.ie)

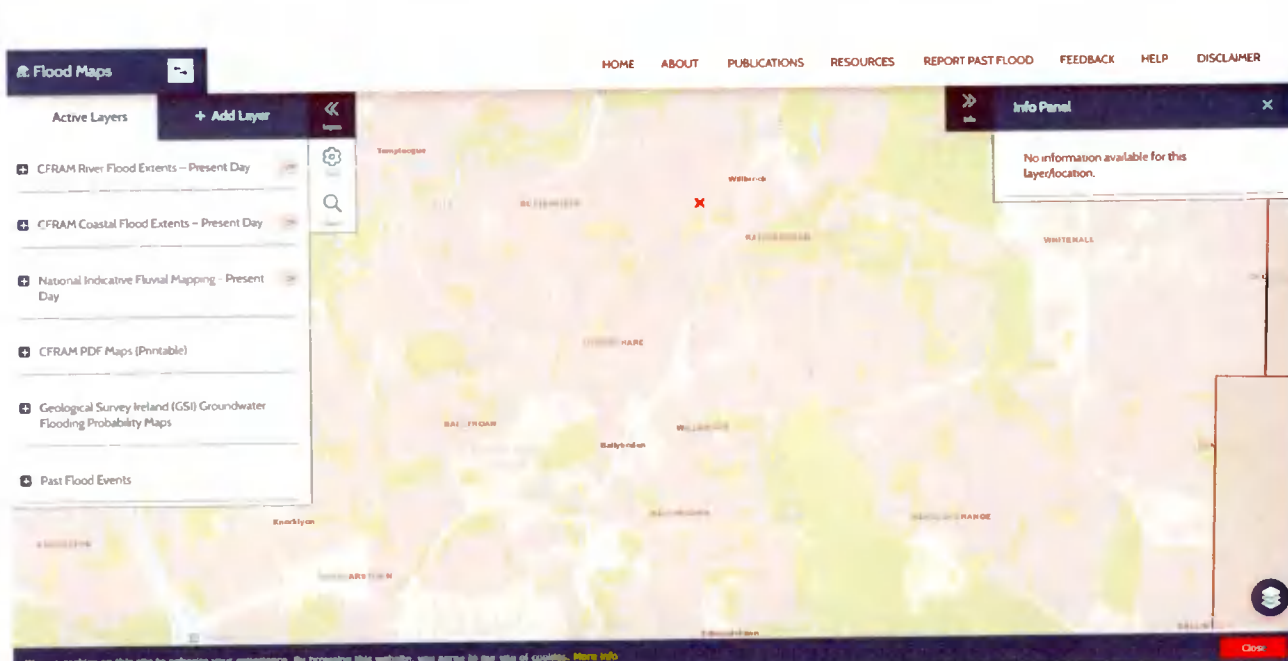


Figure 5 Site location (Floodmaps.ie)

## 4.1 Reference Publications

OPW Flood Records – [www.floodmaps.ie](http://www.floodmaps.ie)

OPW Flood Records – [www.myplan.ie](http://www.myplan.ie)

OPW Flood Studies update web portal – [www.CFRAM.ie](http://www.CFRAM.ie)

Historic O.S. Maps

Local Authority Reports

Dun Laoghaire-Rathdown Drainage Records

The Planning system and Flood Risk Management – Guidelines for Planning Authorities  
November 2009

## 4.2 Sources of Potential Flooding

The following potential sources of flooding have been reviewed and evaluated for this particular site:

### 4.2.1 Coastal

A review of the records from the OPW website show there is no risk of potential flooding in the vicinity of the relevant property.

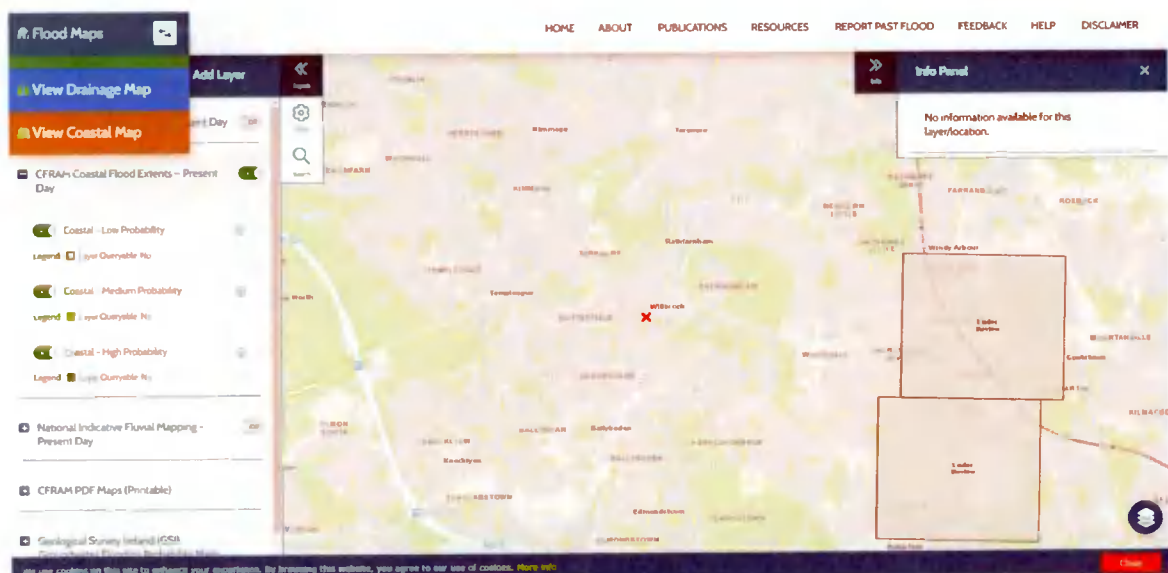


Figure 6 Coastal flooding – All events – present day (Floodmaps.ie)



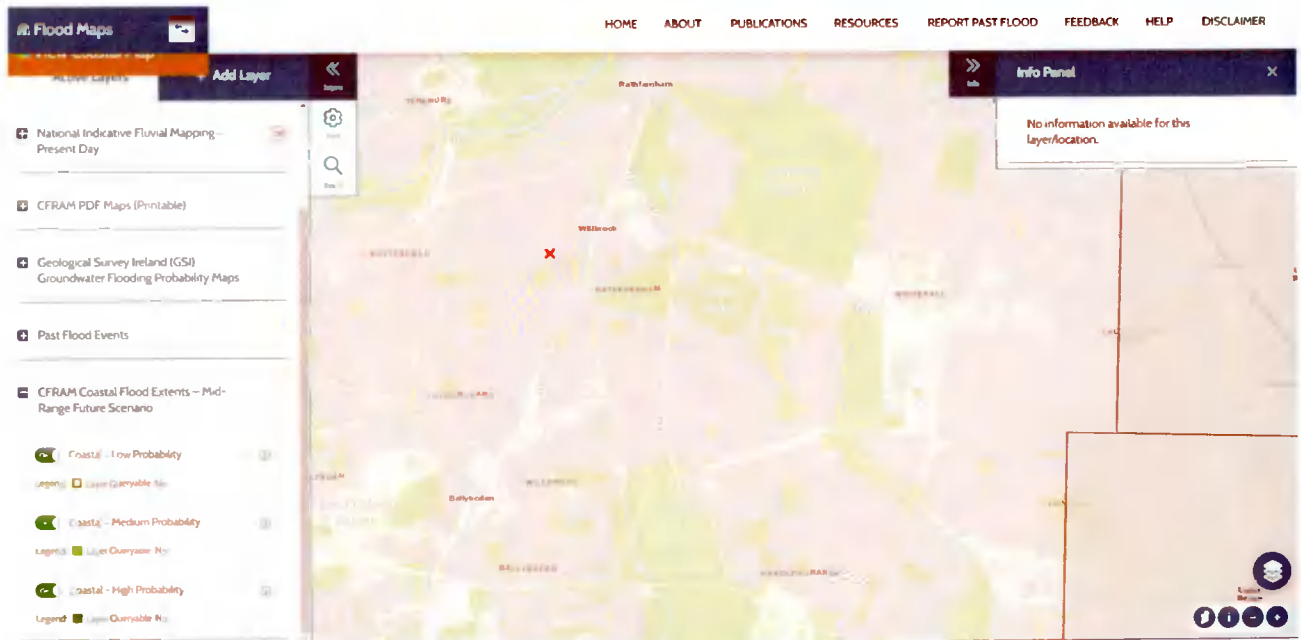


Figure76 Coastal flooding – All events inc. climate change (Floodmaps.ie)

Based on this information, we believe that the risk of coastal flooding to the site can be rated as 1 (Very Low).

#### 4.2.2 Fluvial

Fluvial or river flooding occurs where the capacity of the conveying watercourse (river or stream) is exceeded as a result of heavy rainfall or blockage and water overflows the banks of the water course.

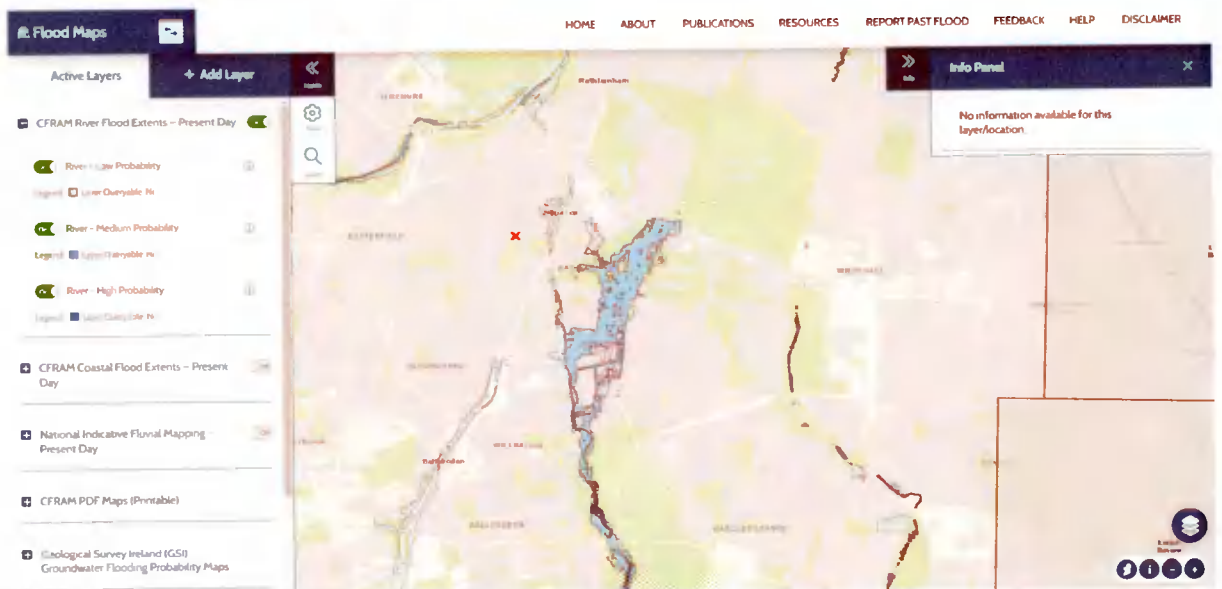


Figure 8 Fluvial flooding - All events – present day (Floodmaps.ie)

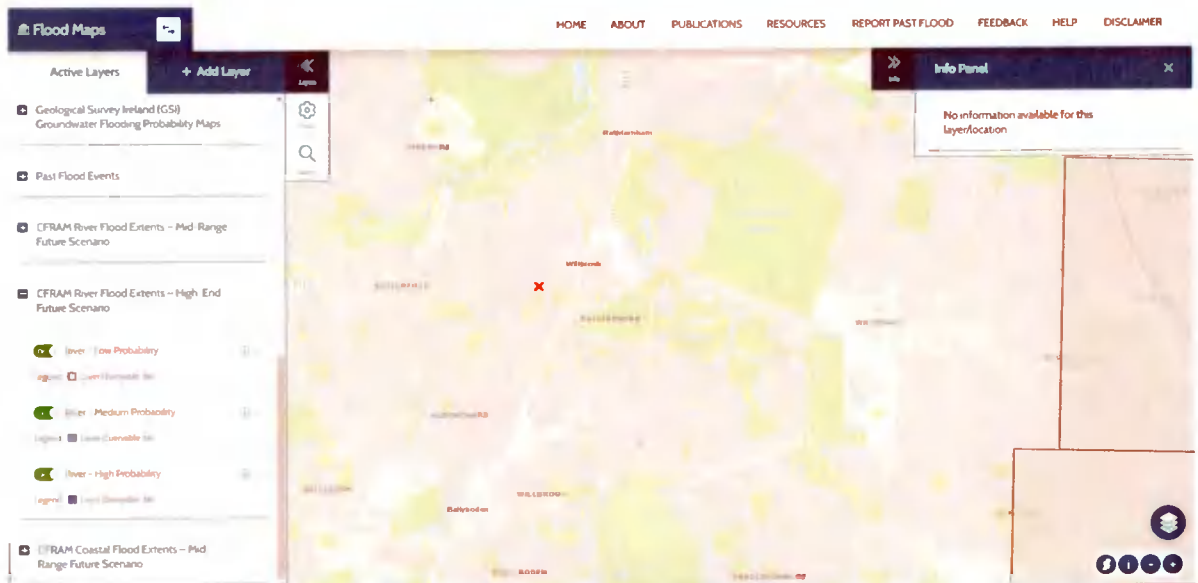


Figure 9 Fluvial flooding – All events inc. climate change (Floodmaps.ie)

Future flood level predictions taken from the Floodmaps.ie website show that there should be no risk to the property from fluvial sources. The risk posed from fluvial sources can be classed as 1 (Very Low).

4.2.3 Pluvial

Pluvial or over ground flooding occurs as a result of water flowing over the surface of the ground which can occur where the infiltration of the receiving ground is exceeded. According to the maps provided by Floodmaps.ie there were no historic recorded instances of flooding to the site.

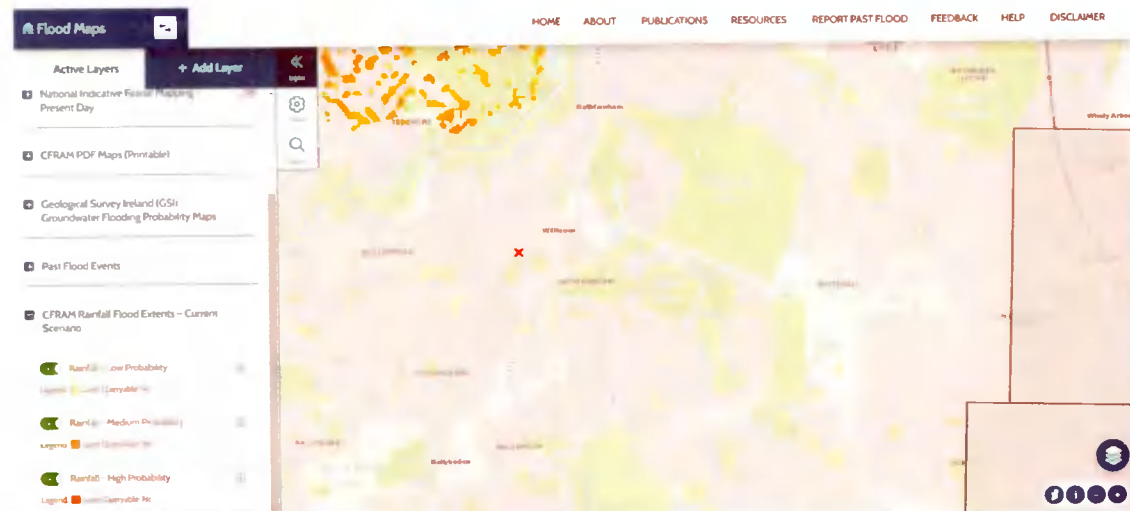


Figure 10 Pluvial flooding - Extreme event (Floodmaps.ie)

The map above indicates that no flooding shall occur in the vicinity of the site. Given the above, the risk of pluvial flooding can be classed as 1 (Very Low).

4.2.4 Flooding from Public Sewers

There are no past recorded instances of flooding from public sewers in the OPW records. Given the above, the risk of flooding from the public sewer can be classed as 1 (Very Low).

#### 4.2.5 Flooding from Ground Water Sources

There are no recorded instances of flooding from ground water sources in the OPW records. Future flood predictions show no ground water level rising to cause flooding. Given the above, the risk of flooding from ground water sources can be classed as 1 (Very Low).

#### 4.3 Justification Test

Following a review of the Strategic Flood Risk Assessment (SFRA) for the South Dublin County Development Plan 2016 it has been assessed that the site should be considered as Flood Zone C for development purposes in accordance with MDW657\_0012 of the SFRA and is considered suitable for development.

Based on the information outlined above we are of the opinion that the property has a low risk of flooding in the future and will not require mitigation measures.

### 5 Conclusion

Based on the information outlined previously, we are of the opinion that the proposed development has a low risk of flooding in the future.

It is proposed to provide a green roofs in order to reduce surface water and permeable paving to hardstanding areas as sustainable measures in relation to the discharge of surface water. The foul waste discharging from the new extension shall be collected with a new network of pipes which shall connect to the existing on site system and therefore discharge to the public network through the existing connection.

Prepared by:



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for CORA Consulting Engineers

Reviewed by:

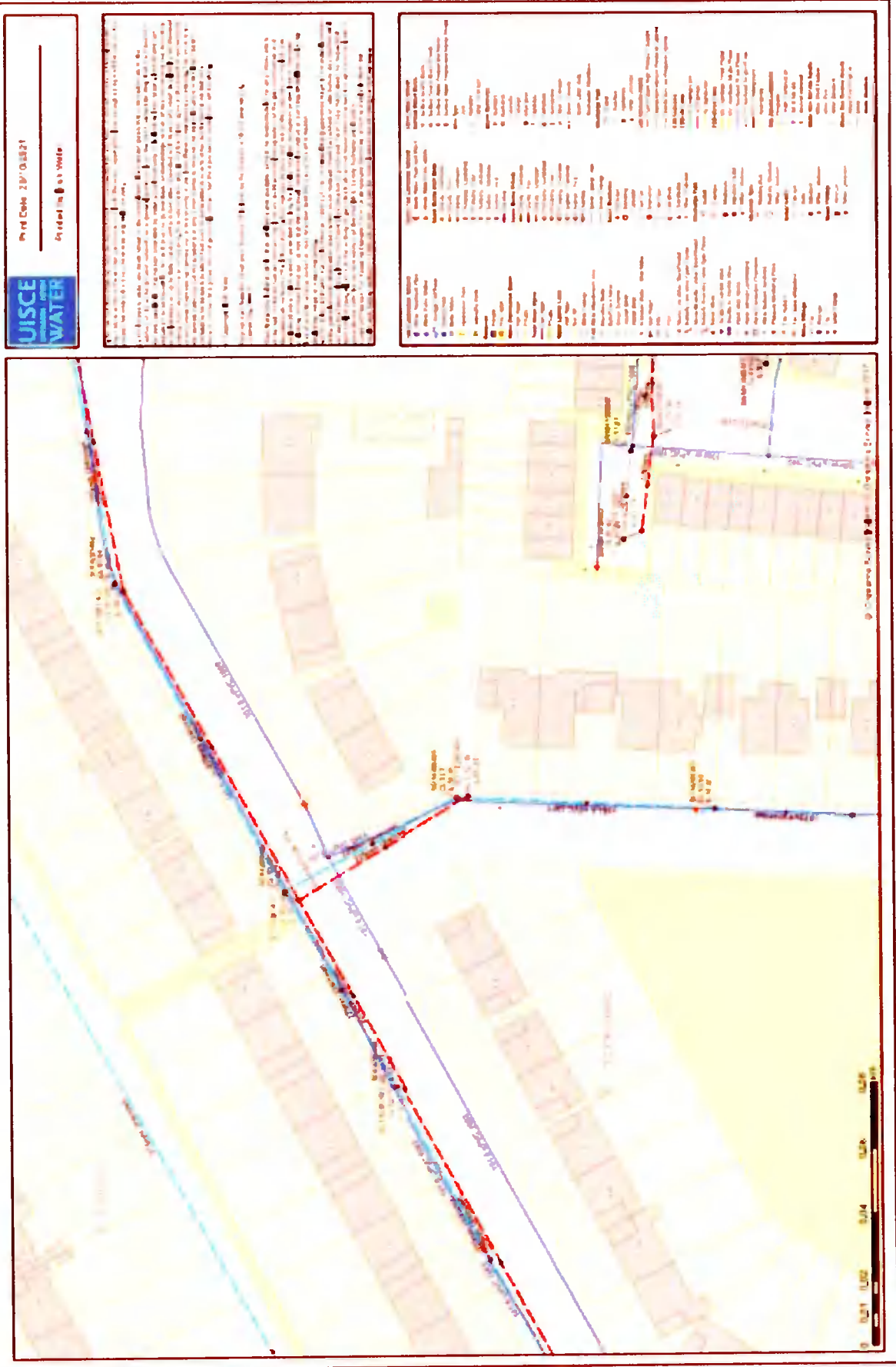


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## Appendix A

### Existing Drainage Records

Irish Water Web Map



## Appendix B

### Flooding – Local Area Report

HOME
ABOUT
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FEEDBACK
HELP
DISCLAIMER

**Flood Maps**

[+ Add Layer](#)

**Active Layers**

Go to the **Tools** tab to create a past flood event summary report.

- Past Flood Event
- Single Flood Event
- Recurring Flood Event
- Layer Queryable: Yes
- Past Flood Event Photos
- Legend
- Past Flood Event Extents
- Legend
- Layer Queryable: Yes
- Geological Survey Ireland (GSI) Winter 2015/2016 Surface Water Flooding
- Legend
- Geological Survey Ireland (GSI) Maximum Historic Groundwater Flooding
- Legend

**Flood Type**

- Groundwater
- Groundwater/Surface water

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## Appendix C

### Proposed Drainage Layout





