# Flood Risk Assessment

for

## Infill Scheme for one Dwellings & Associated works

for

## Gary Povey

July 2021

**AKM**

## 1.0    INTRODUCTION

AKM Design was commissioned to undertake a Flood Risk Assessment as part of a proposed planning application for a new dwelling and associated works.

The purpose of the report is to identify and quantify the potential flood risk of the site.

### 1.1.    Site Location

The site is located at 56 St Johns Close, Clondalkin, Dublin 22. The site contains an existing single storey dwelling and is located within an existing housing estate. The site comprises an existing single storey dwelling located on large site.
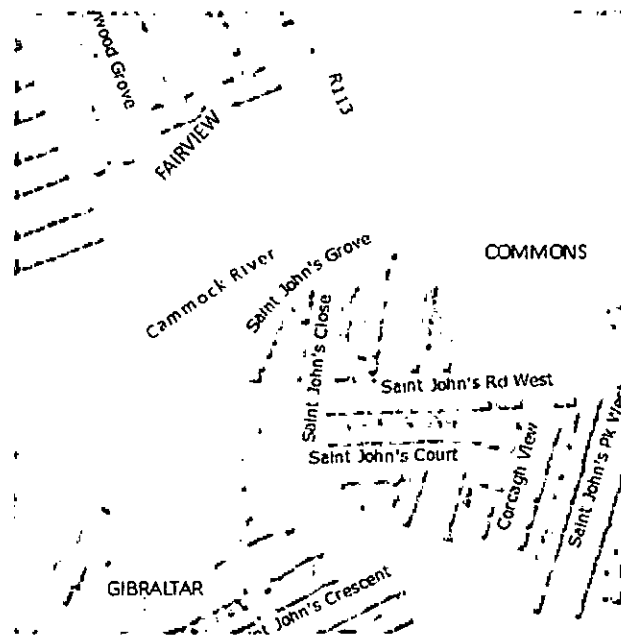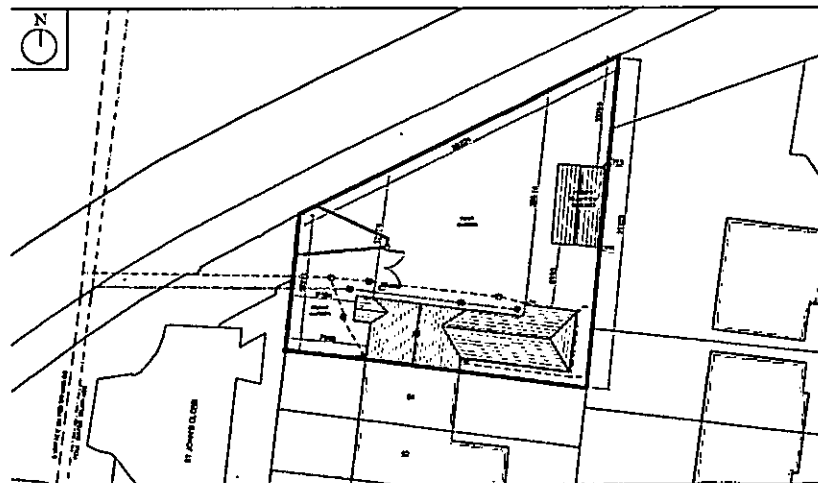


Figure 1.0 - Location of site



Figure 1.1– Existing site layout ( FFL of existing house is 65.50.)

## 1.2    Planning System & Flood Risk Management Guidelines

*"The Planning System and Flood Risk Management Guidelines for Planning Authorities",*
November 2009 and its Technical Appendices outline the requirements for a site specific
flood risk assessment.

The flood risk management guidelines give guidance on flood risk and development. They
recommend a precautional approach 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 guidelines include definitions of Flood zones A, B, and C as noted below.

**Zone A** (high probability of flooding) is for lands where the probability of flooding is greatest
(greater than 1% or the 1 in 100 for river flooding and 0.5% of 1 in 200 for coastal flooding)
**Zone B** (moderate probability of flooding) refers to lands where the probability of flooding is
moderate (between 0.1% or 1 in 1000 and 1% or 1 in 100 for river flooding and between
0.1% and 1 in 1000 and 0.5% or 1 in 200 for coastal flooding)
**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)

Table 3.2 of the Guidelines indicate that the Sequential Approach mechanism requires this
type of development to be in Flood Zone C i.e. outside the 1000 year flood extents. (It may
also be compatible within flood zone categories A and B but a Justification Test for
development management is then required to determine this.)

It should be noted that Flood Zone C includes all areas outside of Flood Zones A or B.


**Flood Risk Assessment Stages**

This site specific flood risk assessment will initially use existing flood risk information to
determine the flood zone category of the Site i.e. to check if the Guidelines Sequential

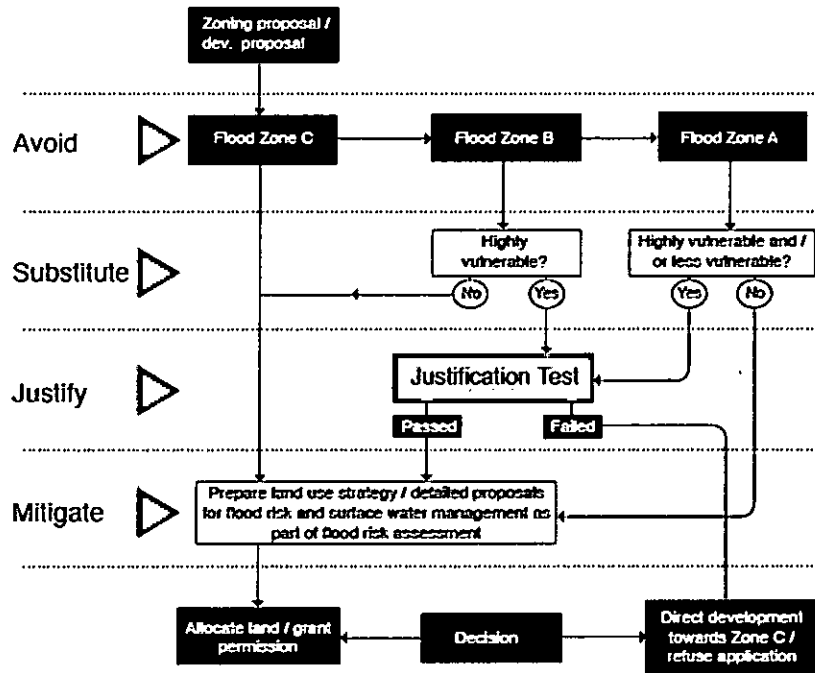Approach has been applied, see Figure 2.1 below for details.

**Figure 2.1** – Sequential Approach mechanism in the Planning Process

| Vulnerability class | Land uses and types of development which include*: |
|---|---|
| Highly vulnerable development (including essential infrastructure) | Garda, ambulance and fire stations and command centres required to be operational during flooding; |
| | Hospitals; |
| | Emergency access and egress points; |
| | Schools; |
| | Dwelling houses, student halls of residence and hostels; |
| | Residential institutions such as residential care homes, children's homes and social services homes; |
| | Caravans and mobile home parks; |
| | Dwelling houses designed, constructed or adapted for the elderly or, other people with impaired mobility; and |
| | Essential infrastructure, such as primary transport and utilities distribution, including electricity generating power stations and sub-stations, water and sewage treatment, and potential significant sources of pollution (SEVESO sites, IPPC sites, etc.) in the event of flooding. |
| Less vulnerable development | Buildings used for: retail, leisure, warehousing, commercial, industrial and non-residential institutions; |
| | Land and buildings used for holiday or short-let caravans and camping, subject to specific warning and evacuation plans; |
| | Land and buildings used for agriculture and forestry; |
| | Waste treatment (except landfill and hazardous waste); |
| | Mineral working and processing; and |
| | Local transport infrastructure. |
| Water-compatible development | Flood control infrastructure; |
| | Docks, marinas and wharves; |
| | Navigation facilities; |
| | Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location; |
| | Water-based recreation and tourism (excluding sleeping accommodation); |

The proposed residential development includes dwelling houses so it is classified as 'highly vulnerable development' as per table 3.1 above.

Table 3.2 of the Flood Risk Management Guidelines (shown below) identifies the types of development that would be appropriate for each flood zone and those that would be required to meet the Justification Test.

| | 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.

A three staged approach to undertaking a Flood Risk Assessment is recommended.

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 of the development, impacts of the flooding elsewhere and the effectiveness of any proposed mitigation measures.
This report addresses the requirements for Stage 1 and Stage 2.

## 2.0 FLOOD RISK ASSESSMENT

### 2.1 Background

This flood risk assessment has been compiled based on information received from the following sources:

- South Dublin County Council
- Available Drainage Record Drawings
- Available OPW Flood Maps and Reports
- Available CFRAMS Pluvial, Fluvial & Coastal Maps
- Topographical survey

This report is compiled from the information gathered from the above and is prepared for the purposes of a planning application. The flood risk is based on the judgement and experience and based on available documentation.

The sources of potential risk of flooding include coastal, fluvial, pluvial, public sewers and groundwater. This document will identify these potential sources and categorise the risk as either very low, low, medium, high or very high.

The camac river is located about 60 metres to the north of the site. The river flows in a westerly direction from Corkagh Park. The river is fully contained with a public park.

CFRAM predicted flood mapping has been carried out for the area – see appendix. An inspection of these maps shows there is predicted flooding at the subject property for the all events. A copy of the CFRAM maps are included in Appendix of this report.

A Topographical survey was carried out by the Holton Surveyors on behalf of the applicant. Please refer to the existing site plan.

### 2.2 Review of Flood History of site and surrounding area

We know there was flooding of the Liffey / Camac catchment during Nov 1981 and June 1993. We are informed by owners the house did not flood at this time. The flood event was cause by prolonged rain and there was flooding at Leinster Terrace and old Nangor Road.

From our enquiries made to the OPW (www.floodmaps.ie) we determined that there are no recorded flood events on the subject site.

### 2.3 Coastal Risk

Coastal flooding is caused by higher sea levels than normal, largely as a result of storm surges resulting in sea overflowing onto the land. Coastal flooding is influenced by the following factors which can work in tandem:

- High tide level
- Low barometer pressure made worse by high winds
- Wave action dependent on wind speeds and direction, local topography and exposure.

The primary historical coastal flood event in Dublin City occurred on the 1st of February 2002, which was recorded as 5.46m Lowest Astronomical Tide (LAT) at Dublin Port and exceeded the previously recorded 1924 flood event levels (5.1m). The LAT is the metric Admiralty Charts of

Dublin and is converted to Malin Head datum by the subtraction of 2.51m. That is the 5.46m LAT equated to 2.95m Malin Head.

The subject site levels are greater than 65m over Malin Head datum which is greater than the exceptionally high event of 2002. The subject site is located some 13km from the nearest coastline and is deemed sufficiently distant to be not effected by coastal flooding. There is no predicted coastal flooding to the subject site on the CFRAM study.

The 2002 event caused extensive flooding in parts of Dublin City and the coastal region, but there is no recorded flooding having occurred at this development site or its immediate environs.

In our opinion the risk of coastal flooding on this site is very low.

### 2.4 Fluvial Risk

The site is located within flood zone C. River flooding occurs when the capacity of a watercourse is exceeded or the channel is blocked or restricted, and excess water spills out from the channel onto adjacent low lying areas.

We ask the planning authority should refer to the Camac Flood Protection Project. Camac River Phase 1 was complete in 1995 and Phase II in 2001. The applicant is aware of a future planned and ongoing works that are planned in close proximity to the site.

For the worst-case scenario a 1 in a 1000-year event the AEP Fluvial Flood Depth is estimated at 0-0.25m. Please see enclosed CRFRAM map at appendix.

The proposed dwelling will be located above the highest estimated flood levels (1 in a 1000 year event). The proposed FFL 70.00 of the dwelling shall be above the predicted flood level and will be adequately protected from potential flooding.

In our opinion the risk of fluvial flooding on this site is low.

### 2.5 Pluvial Risk

Overland flow occurs when the amount of rainfall exceeds the infiltration capacity of the ground to absorb it. This excess water flows overland ponding in natural hollows.

There are no recent records of the subject site flooding following inspection of OPW flood maps.

In our opinion the risk of pluvial flooding on this site is low.

### 2.6 Flooding from Sewers

Flooding results when flow entering a drainage system exceeds its capacity and the system becomes blocked and / or cannot discharge due to a high water level in the receiving watercourse or outfall.

There is existing local authority drainage infrastructure serving the development. The site is already served by existing foul and storm network. A copy of the Irish Water mapping for the area is included in Appendix of this report.

In our opinion the risk of flooding from sewers on this site is low.

## 2.7     Groundwater

Groundwater flooding occurs when the level of water stored in the ground rises as a result of prolonged rainfall to meet the ground surface and flows out over it. Groundwater flooding tends to be very local and results from interactions of site specific factors such as tidal variations.

This site has no recorded history of groundwater flooding. There is no visible evidence to suggest groundwater flooding would be an issue.

In our opinion the risk of flooding from groundwater on this site is low.

## 2.8     Flood Zone
It is concluded that the subject site is located in Flood Zone C with reference to fluvial flooding. Flood Zone C is defined in the Planning System and Flood Risk Management Guidelines where the probability of flooding from rivers and the sea is low (less than 0.1% or 1 in 1000 year return for both river and coastal flooding).

## 2.9     Vulnerability
Table 3.1 of the Planning System and Flood Risk Management Guidelines for Planning Authorities gives a detailed classification of vulnerability of different types of development. Buildings with a commercial / industrial use are classed as less vulnerable developments and these are considered a suitable land use for Flood Zone C and negates the need to carry out a justification test.

|  | 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.

## 3.0    Conclusions

A flood risk assessment for the proposed residential development at St Johns, Clondalkin has been undertaken following the methodology recommended in the FRM Guidelines.

The PFRA Map does not indicate any risk of pluvial or groundwater related flooding.

Based on the ground levels at the site the proposed dwelling will be within the flood zone C. There is a Low Probability for a flooding event of between 0mm - 0.25mm (1 in 1000-year event) at the site.

The site is suitable for development subject to finished floor levels of the new dwelling being set above potential flood extent levels.

The proposed FFL 70.00 of the dwelling shall be above the predicted flood level (1 in 1000-year event) and the dwelling will be adequately protected from potential flooding.

The site shall be further protected when the Camac Flood Protection Works are complete. Based on the information available it is our opinion that this site is suitable for development.
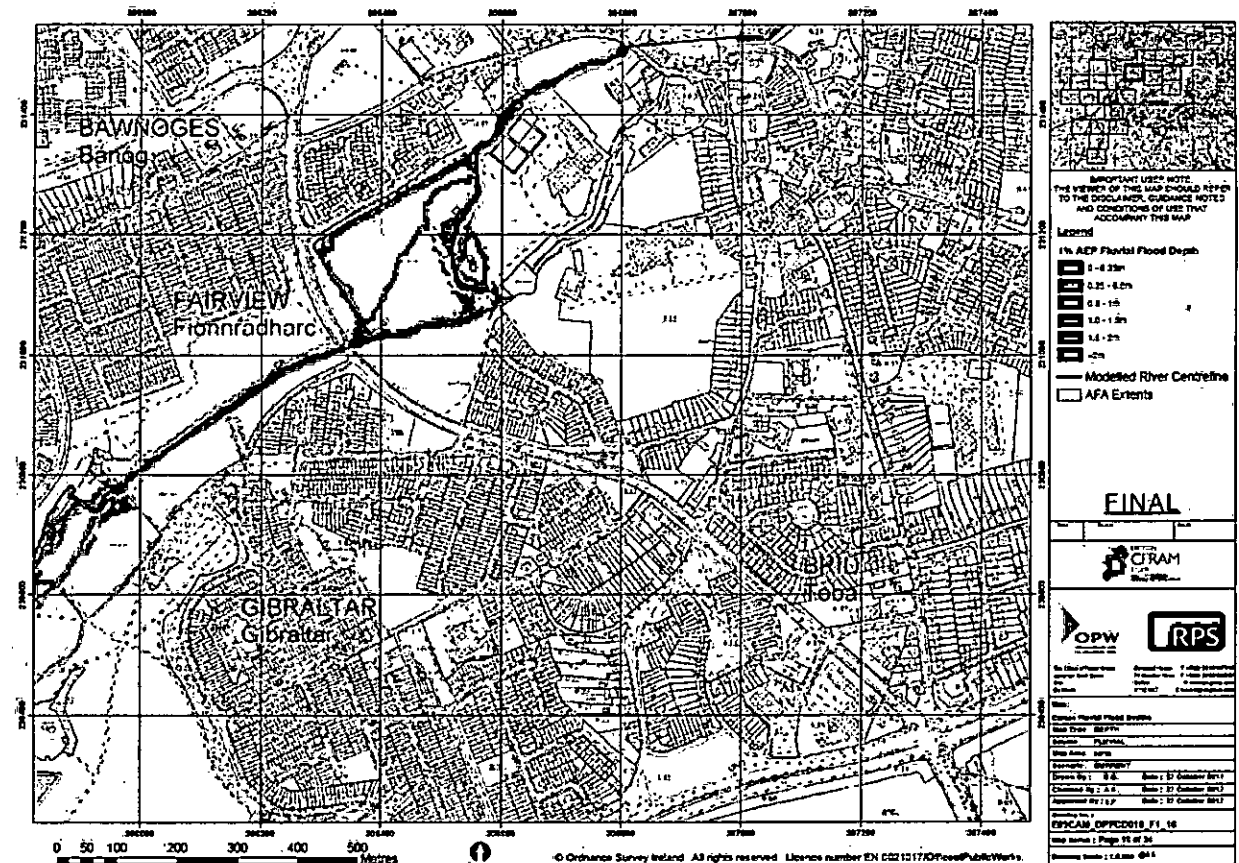
It is also recommended to incorporate appropriate SuDS principles to ensure that any surface water that may accumulate on the site is managed sufficiently and sustainably while discharging to the drainage network.
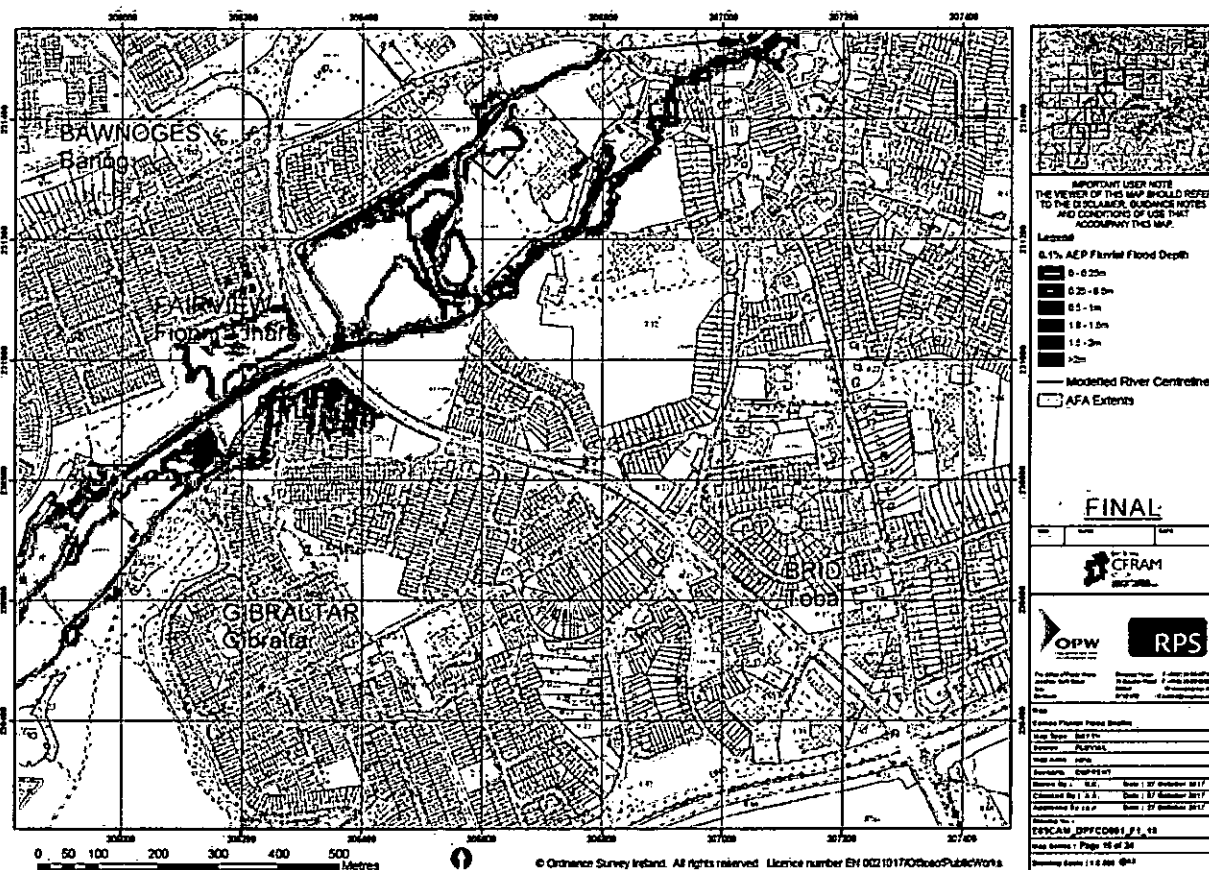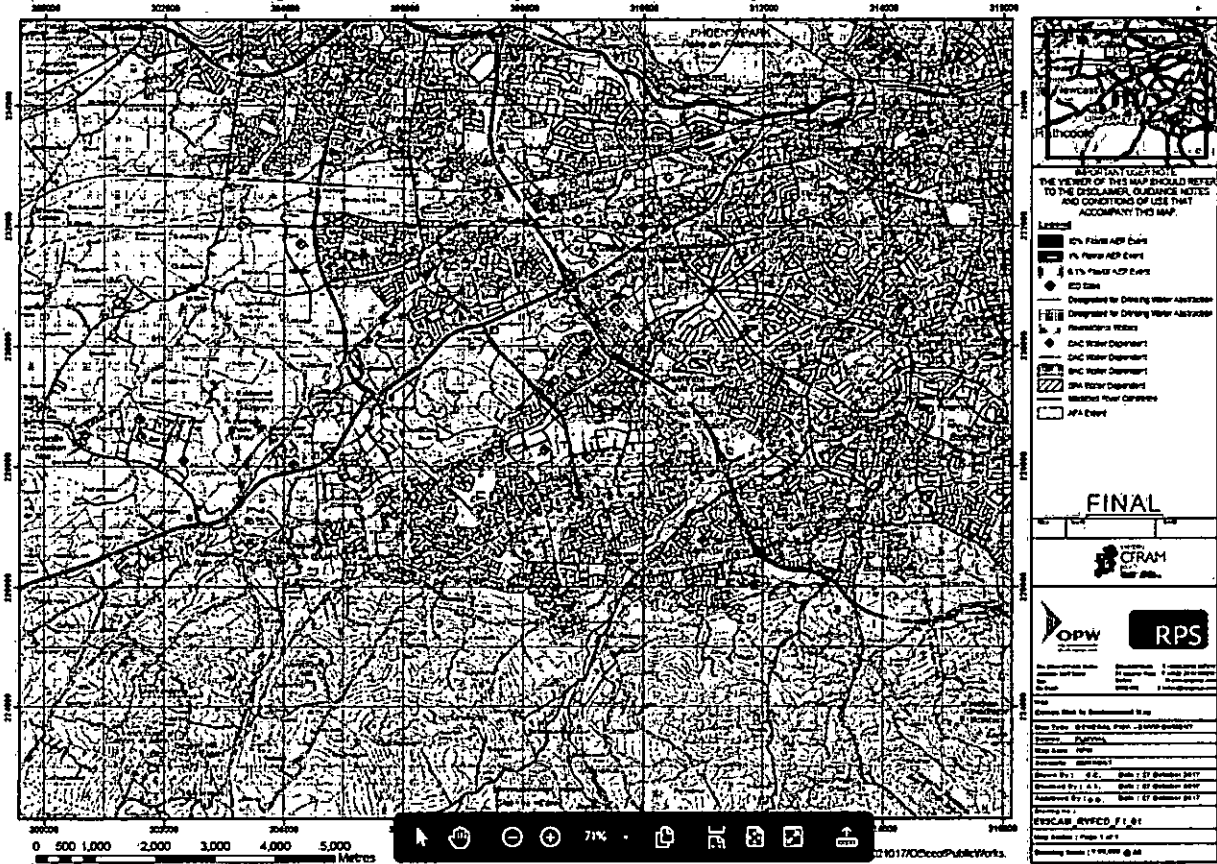
**AKM Design**

## APPENDIX – FLOOD MAPS
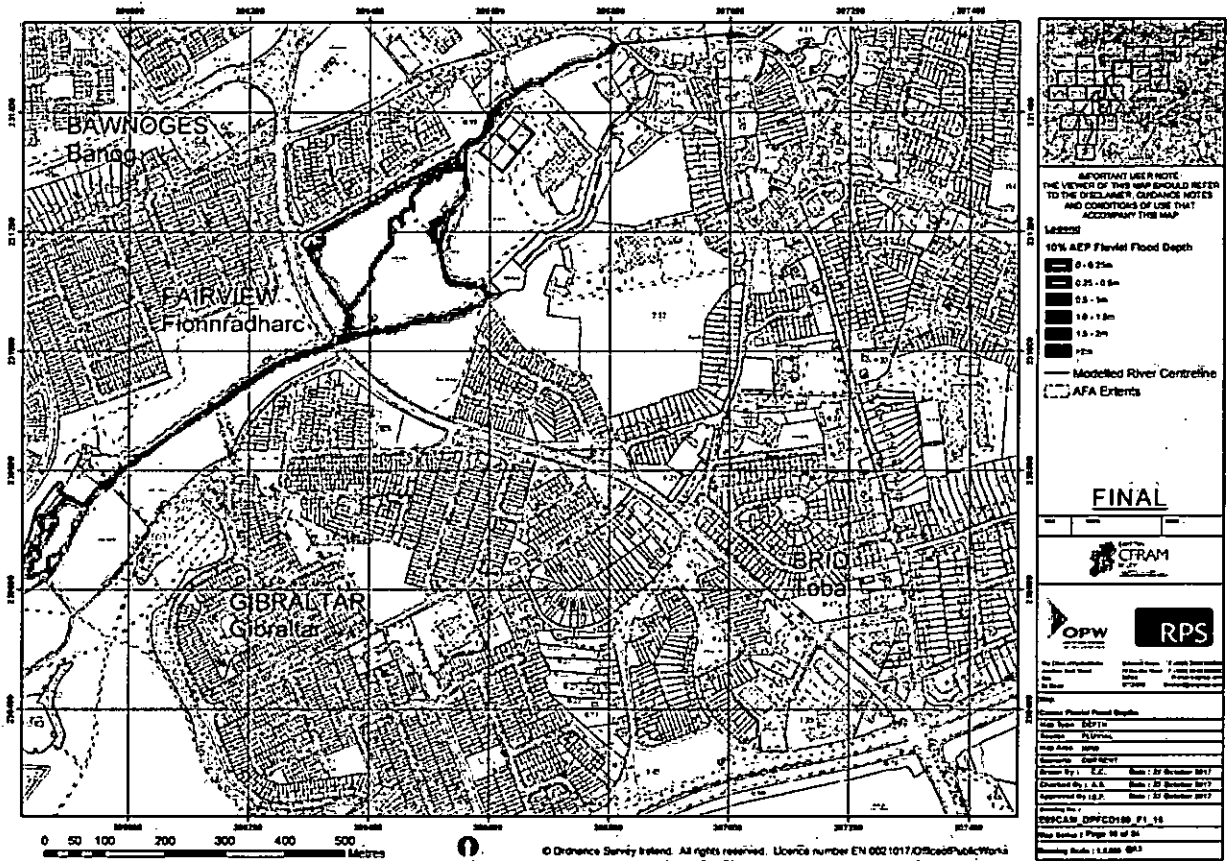
(High Probability)
Fluvial Flooding - Return Period: 10% AEP EVENT

(Medium Probability)
Fluvial Flooding - Return Period: 1% AEP EVENT

(LOW Probability)
Fluvial Flooding - Return Period: 0.10% AEP EVENT

**Fluvial Risk Map**