

Ballymore Developments Ltd.

**Lands at the Naas Racecourse, Naas,  
Co. Kildare**

**Site Specific Flood Risk Assessment  
(Planning Submission)**

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## Document Control

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# 1 Introduction

Donnachadh O'Brien & Associates Consulting Engineers Ltd. (DOBA) have been instructed by the Client, Ballymore Developments Ltd., to prepare a Site Specific Flood Risk Assessment to accompany a Planning Submission to Kildare County Council (KCC) for the proposed Large Scale Residential Development (LRD) on lands at the Naas Racecourse, Naas, Co. Kildare.

The report provides a site-specific Flood Risk Assessment (FRA) for the proposed development. The assessment investigates potential sources of flood risk and includes 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.

## 1.1 Flood Risk Management Guidelines for Planning

In September 2008 "The Planning System and Flood Risk Management Guidelines for Planning Authorities" (Guidelines) were published by the Department of Environment, Heritage and Local Government in Draft format. The 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.

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. There are three flood zones defined:

- **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).

## 1.2 History of Flooding

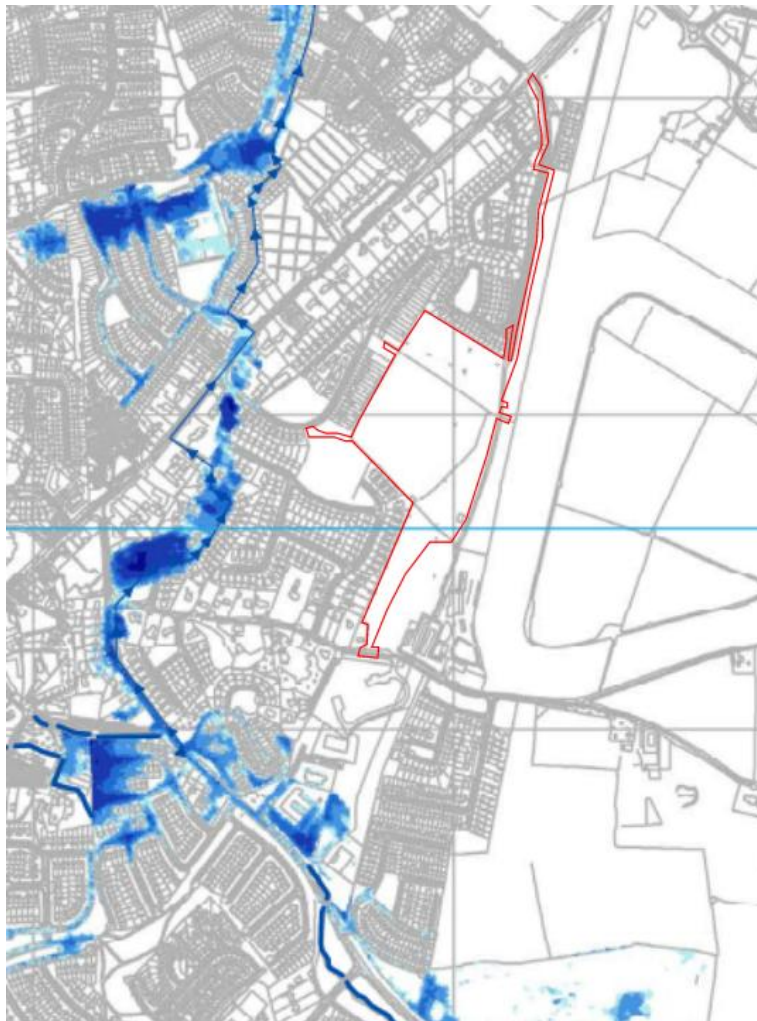
As part of the overall exercise to establish the potential flood risk to the subject site, DOBA carried out a review of available and recorded information on flooding in the area. The following sources were consulted as part of the review:

- OPW Flood Records,
- Historic Flood Records.

There are no historical flood events recorded within the Naas Racecourse lands.

### 1.2.1 KCC Naas Flood Hazard Mapping

Figure 1 is an extract from the mapping available from the available Naas Flood Relief Scheme mapping and illustrates that the proposed development site is in Flood Zone C and is not at risk of flooding. As can be seen, there are no lands within Naas Racecourse that are subject to flooding and the lands are therefore categorised as Flood Zone C Lands.



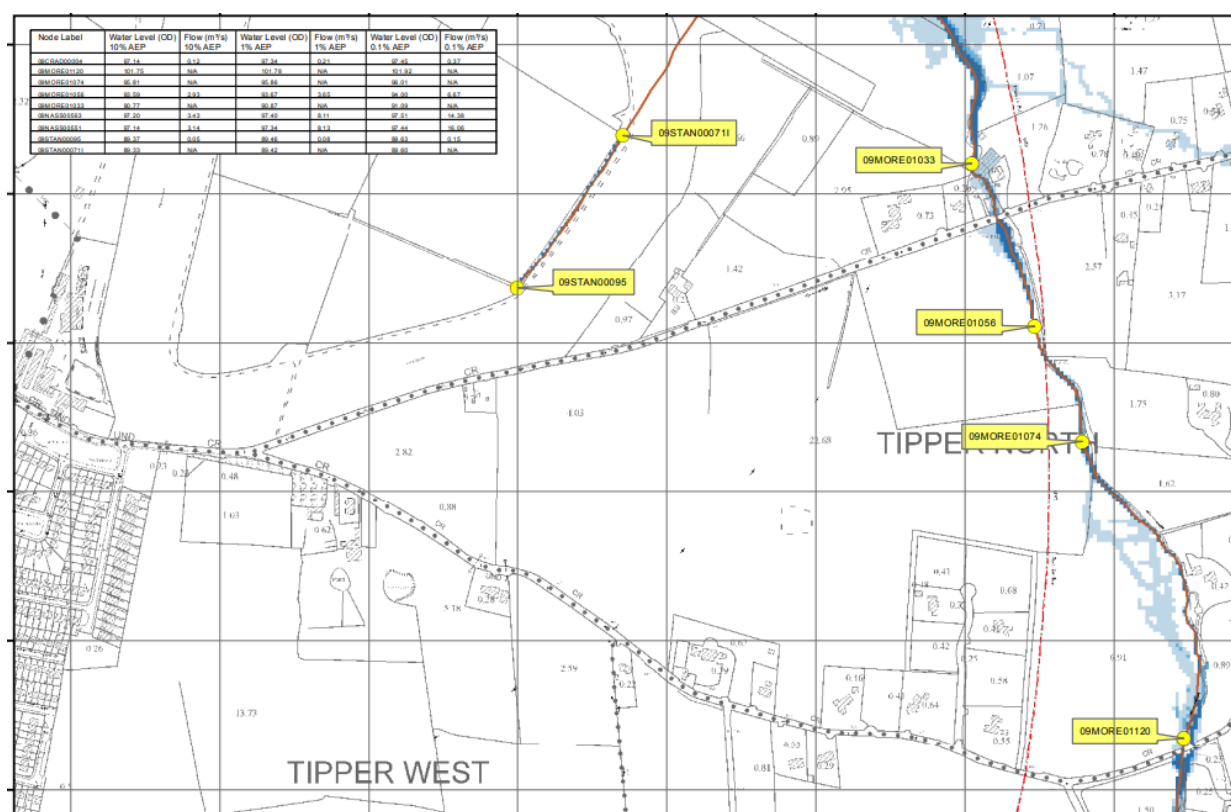
**Figure 1:** KCC Naas Flood extent mapping (Source: CFRAM Maps – Floodinfo.ie)

### 1.2.2 CFRAM Mapping

Predictive flood risk mapping published as part of the OPW CFRAMS mapping was reviewed to establish the flood risk to the proposed development. This mapping was prepared based on the output of hydraulic modelling carried out. The Morrell watercourse and associated tributaries were modelled as part of the assessment. Figure 2 below is an extract from the relevant CFRAMS mapping. To the east of the racecourse, the Morell River is hydraulically modelled along with a smaller tributary watercourse, which serves Naas Racecourse lands. There are some nodes which provide flood level information for the 1:10, 1:100 and 1:1000 flood events.

The relevant flood levels are as follows:

- 09MORE01033 0.1%AEP(1:1000-year) flood level 91.90m OD
- 09STAN00095 0.1%AEP(1:1000-year) flood level 89.63m OD

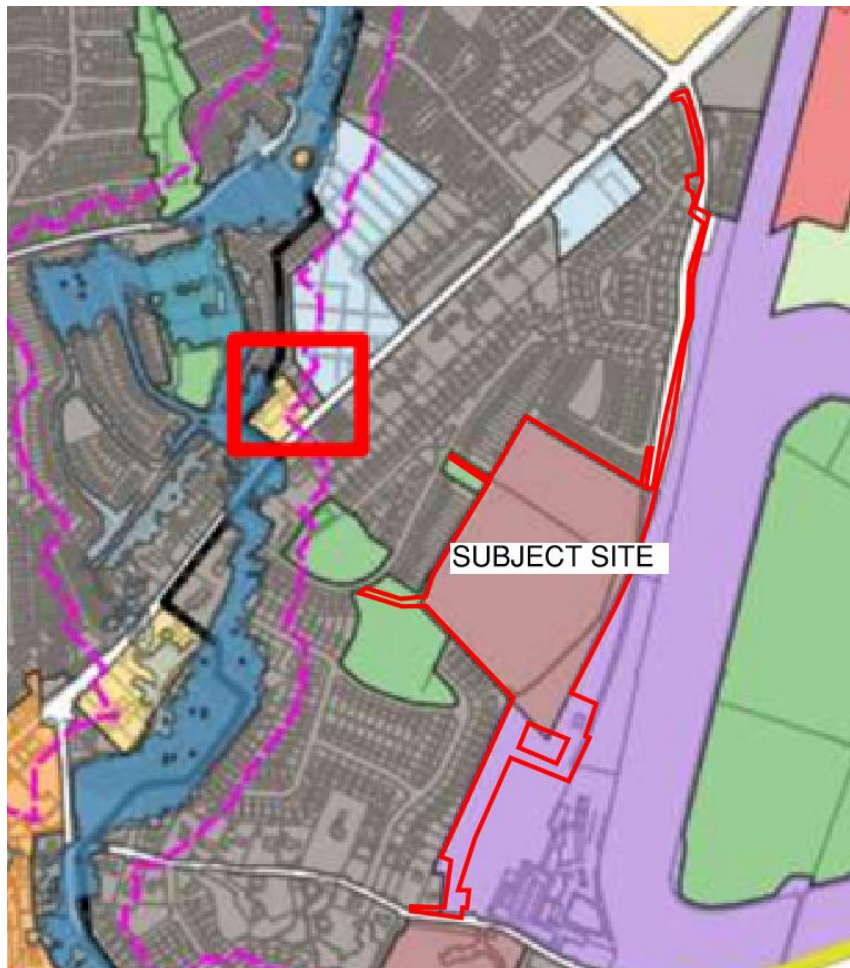


**Figure 5: OPW CFRAMS mapping**

### 1.2.3 Naas Local Area Plan 2021-2027 – Strategic Flood Risk Mapping

Strategic flood risk mapping published as part of the Naas Local Area Plan has also been reviewed to establish the potential flood risk in the vicinity of the subject site. Figure 2 is taken from section 7.2.10

of this report. It shows the area of the Blessington Road, which includes the Racecourse lands. This mapping indicates that there is no fluvial flood risk to the proposed site.



**Figure 2: Map extract from section 7.2.10 – showing Racecourse lands**

### **1.3 Potential Sources of Flooding**

The potential risk to the proposed development associated with each of the following sources of flooding is presented in this section.

- Fluvial flooding,
- Coastal/ Tidal flooding,
- Pluvial flooding,
- Groundwater flooding.

### **1.3.1 Fluvial Flooding**

Fluvial flooding is the result of a river exceeding its capacity and excess water spilling out on to the adjacent floodplain. From a review of all available mapping and predicted flood water levels, it can be seen that the proposed site is fully located within Flood Zone C and not at risk from fluvial flooding.

### **1.3.2 Coastal/ Tidal Flooding**

From a review of the site location, mapping and predicted flood water levels, the site is not at risk from coastal flooding.

### **1.3.3 Pluvial Flooding**

Pluvial flooding is the result of rainfall-generated overland flows which arise before run-off can enter any watercourse or sewer. It is usually associated with high intensity rainfall. The PFRA mapping available for the site indicates that the proposed site is located outside of an area predicted to flood and not at risk from pluvial flooding.

The proposed surface water drainage network has been designed in compliance with the Greater Dublin Strategic Drainage Study (GDSDS). It is proposed to incorporate extensive Sustainable Urban Drainage Systems (SuDS) to further attenuate and treat run-off generated within the proposed development. As the site investigation has demonstrated, there is good percolation in the existing soils and infiltration techniques, permeable pavements and tree pits/ bio retention areas to further reduce the rate of surface water run-off discharged from the development site.

By restricting the rate of run-off from the development site to the  $Q_{bar}$  greenfield run-off rate, there will not be any increase in the flow discharged from the site following its development, therefore there will be no increase in pluvial flood risk as a result of run-off discharged from the site to the natural drainage network.

### **1.3.4 Groundwater Flooding**

The OPW's PFRA includes an assessment of groundwater flood risk. The PFRA flood risk mapping does not predict any groundwater flooding within or surrounding the subject site.

## **1.4 Estimate of Flood Levels and Flood Zone**

Following review of the predictive flood risk mapping published as part of the Avoca River Flood Relief Scheme, it is concluded that there is no risk to the site is associated with potential flooding.

From available CFRAMS mapping, the estimated water levels at the nearest watercourse adjacent to the site are as follows. The 0.1% AEP (1:1000-year event) has been selected as a conservative estimate of the 1% AEP (1:100-year event) plus climate change.

- 09MORE01033      0.1% AEP (1:1000-year) flood level      91.90m OD
- 09STAN00095      0.1% AEP (1:1000-year) flood level      89.63m OD

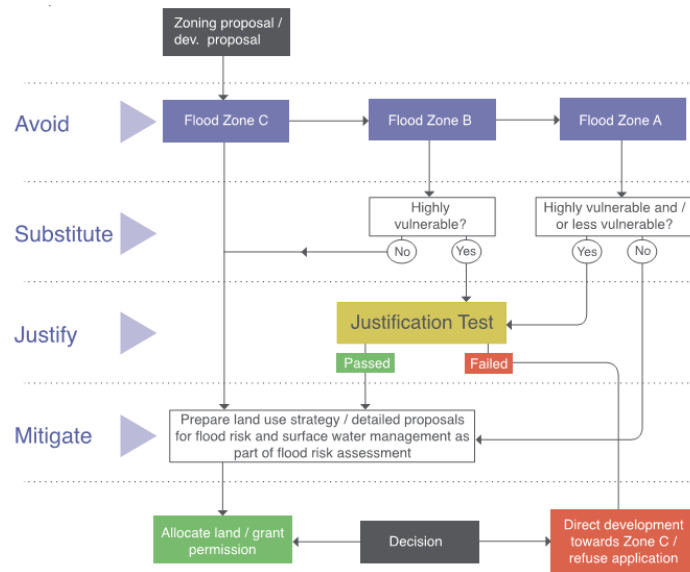
Advice on the expected impacts of climate change and the allowances to provide for future flood risk management in Ireland is given in the "OPW Assessment of Potential Future Scenarios, Flood Risk Management Draft Guidance", 2009. Two climate change scenarios are considered, the Mid-Range Future Scenario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

On review of the available OPW CFRAMS information, including a rewire of the MRSF and HRSF scenarios, the proposed Finished Floor Levels of the residential units in the development range from is 93.7m to 99.0m OD Malin, which is a minimum of 1.8m above the nearest predicted fluvial flood water in the Morrell watercourse and 4.07m above the watercourse in the middle of the racecourse. The lowest proposed Finished Road Level of the site is approximately 93.2m OD Malin, (at the connection to the existing Gallops Avenue) which is 1.3m above the predicted fluvial flood water levels.

This demonstrates that all of the proposed residential units and roads are located within Flood Zone C, have freeboard to the nearest predicted flood levels well in excess of the recommendations of the Flood Risk Management Guidelines and therefore the flood risk to the development is assessed as being negligible.

## 1.5 Sequential Approach and Justification Test

A sequential approach is a key tool in ensuring that development, particularly new development, is first and foremost directed towards land that is at low risk of flooding. The philosophy used in this approach is illustrated in Figure 3 and sets out the mechanism for the use of the sequential approach to development in flood areas from the planning perspective.



**Figure 3** Sequential Approach Mechanism in the Planning Process

## 1.6 Vulnerability Classification

Table 3.1 of The Planning System and Flood Risk Management Guidelines for Planning Authorities provides a classification of vulnerability of different types of development. Residential developments are classified as highly vulnerable developments. Figure 4 illustrates those types of development which would be appropriate to each flood zone and those which 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  |

**Figure 4:** Vulnerability of Development vs Flood Zone

The proposed land use for the development is predominantly residential which falls within the ‘Highly Vulnerable Development’ classification, as shown in Figure 4. Based on the review carried out of the predicted flood water levels and the topographical survey, the proposed residential units have been located within Flood Zone C lands. (Low probability of flooding). It can be seen from Figure 4 that Flood Zone C is a suitable land use for Highly Vulnerable Developments. The proposed access roads within the masterplan development layout are located within Flood Zone C. Therefore, in accordance with the

sequential approach mechanism of the Flood Risk Management Guidelines, a Justification test is not required, as:

- the land is zoned for residential development
- the development lies exclusively within Flood Zone C lands
- appropriate SUDS design has been adapted for flood and surface water management as part of part of the flood risk assessment
- No further flood mitigation is deemed necessary

## **1.7 Conclusions**

This site-specific Flood Risk Assessment has been carried out to assess the impact of flooding on the proposed overall lands, including the residential development, the proposed creche and the Gallops Avenue Extension. This report was prepared following the guidance contained in The Planning System and Flood Risk Management Guidelines for Planning Authorities. All existing information has been reviewed regarding the flood risk in the area to provide reliable estimates of extreme rainfall event water levels.

The proposed finished floor and road levels have been demonstrated to be substantially above the nearest predicted flood levels and the entire proposed site is within Flood Zone C lands with negligible risk of flooding. Implementation of SUDS throughout the site for surface water drainage network ensures that there will be no increase in pluvial flood risk as a result of the proposed development.