

Proposed Development at Courtstown, Little Island, Co. Cork

Flood Risk Assessment

Client: Ruden Homes Ltd
Prepared by: MMOS Consulting Engineers
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1. Introduction

This flood risk assessment uses existing information to identify and confirm whether there may be flooding or surface water management issues on the particular site that may warrant further investigation, and also describes the possible impacts of the proposed development regarding to flood risks and identifies mitigation measures to minimise any impacts.

This assessment has been prepared on behalf of Ruden Homes Ltd. as part of a planning application to Cork County Council as described below.

The development will consist of:

- The construction of 172 no. residential units to include 146 no. dwelling houses (with 83 no. dwelling houses to include the option for constructing a ground floor extension to the rear); 6 no. duplex units; and 20 no. apartments.
- Provision of 1 no. creche and 4 no. commercial units.
- Upgrading of the existing vehicular access to the site and the creation of a signalised junction on Ballytrasna Part Road (L-2985-0), including footpaths, cycle lanes and pedestrian crossing points, to facilitate access into the site,
- The provision of a new distributor road, including footpaths and cycle lanes, connecting the proposed residential development with Ballytrasna Park Road.
- All associated infrastructure and ancillary development works to include the provision of roads, footpaths and cycle lanes as well as the provision of vehicular connections to adjoining lands with pedestrian/cycle facilities; Proposed diversion and undergrounding of the existing 10KV overhead electricity line and associated poles traversing the site; landscaping & amenity areas, lighting, drainage and services connections; bicycle and car parking; bin storage; and boundary treatments including fencing and landscape buffer of mixed native hedge planting along the eastern boundary of the site.

1.1 Methodology

This study sets out to

- i. Identify the flood risk from multiple sources around the existing site area.
- ii. Assess the flood risk for implementing the proposed development in the site area.
- iii. Analyse the impacts of the proposed development, both during construction and operational phases.
- iv. Propose mitigation measures to avoid the risk of flooding during construction works and the operational phase.

1.2 Scope of the Flood Risk Assessment

The scope of this assessment includes confirming the sources of flooding which present risks to the proposed development, identifying possible measures to mitigate any flood risk not only on the proposed development but also in the adjacent areas.

1.3 Relevant Guidelines

This assessment has been carried out following the relevant Standards and Guidelines, including but not limited to:

- IS EN 752: 2017 – Drain and Sewer Systems Outside Buildings – Sewer system management (April 2017)
- Office of Public Works (OPW) The Planning System and Flood Risk Management Guidelines for Planning Authorities (2009)
- Cork City Minimum Engineering Requirements (October 2010)
- Greater Dublin Strategic Drainage Study (GSDSDS) – Volume 2: New Developments (March 2005)
- Lee Catchment Flood Risk Assessment and Management Study (January 2014)
- Flood Risk Statement for the Draft Wind Energy Development Guidelines (2019)

1.4 Existing Site

The site for the proposed development is located at Courtstown, Little Island, Co. Cork and is bounded by Ballytrasna Park Road to the north, a Greenland area to the south and west, and Harbour Point Business Park to the east as shown in Figure 1 below.



Figure 1 – Aerial Site View

2. Flood Risk Assessment

This Flood Risk Assessment (FRA) for the proposed development has been prepared in accordance with the Guidelines for Planning Authorities on 'The Planning System and Flood Risk Management' published in 2009 by the Office of Public Works (OPW) and the Department of the Environment, Heritage and Local Government (DoEHLG). This FRA addresses points 2(i), 2(ii), 2(iii) and 2(iv) of Box 5.1 | Section 5.15 of the guidelines.

The guidelines describe good flood risk practice in planning and development management and seek to integrate flood risk management into the planning process, thereby assisting in the delivery of sustainable development. Planning authorities are directed to have regard to the guidelines in preparation of Development Plans and Local Area Plans, and for development control purposes. For this to be achieved, flood risk must be assessed as early as possible in the planning process.

Other sources of information, attached as appendices, used to compile this FRA include:

- OPW website, www.floodmaps.ie,
- Cork City Development Plan 2022-2028

The stages involved in the assessment of flood risk are listed in the OPW publication as follows:

- Stage 1: Flood Risk Identification
- Stage 2: Initial Flood Risk Assessment
- Stage 3: Detailed Flood Risk Assessment

The OPW publication also outlines a Sequential Approach for determining whether a particular development is appropriate for a specified location in terms of flood risk. The categorisation of the site of this development is presented below.

As outlined in the OPW publication, new developments are divided into three categories which are as follows: Highly Vulnerable Development, Less Vulnerable Development and Water-compatible Development. The proposed development comes under the heading of Highly Vulnerable Development as it is primarily a residential development.

Geographical areas are similarly divided into three categories, based on their risk of river and tidal flooding. The three categories are as follows:

- Flood Zone A – where the probability of flooding from rivers and the sea is the highest (greater than 1% or 1 in 100 years for river flooding and 0.5% or 1 in 200 years for coastal flooding).
- Flood Zone B – where the probability of flooding from rivers and the sea is moderate (between 0.1% or 1 in 1000 year and 1% of 1 in 100 years for river flooding and between 0.1% or 1 in 1000 year and 0.5% or 1 in 200 years for coastal flooding).
- Flood Zone C – where the probability of flooding from rivers and the sea is low (less than 0.1% or 1 in 1000 year for both river and coastal flooding) i.e. all areas which are not within Zones A or B. UPDETED LOOP

2.1 FLOOD RISK IDENTIFICATION

The first stage uses existing information to identify and confirm whether there may be flooding or surface water management issues on a particular site that may warrant further investigation. To initially identify potential flood risks on the site, a number of existing sources were studied as described below.

The first source considered is the OPW Flood Hazard Mapping service. The OPW map presented in Figure 2 shows that no flood incidents have been recorded at the site and do not indicate any flooding events in the immediate area.



FIGURE 2 – PAST FLOOD EVENTS

The possibility of fluvial or tidal flooding on the site is assessed using the guidelines from the OPW Flood Risk Management. Figure 2 above presents the tidal flood extent in green. It is noted that the site area is not affected by any flood extent, which then classifies the area as Flood Zone C.

Table 1 below is an extract from the OPW publication which states whether a particular development is deemed ‘appropriate’ according to its geographical location and vulnerability class.

DEVELOPMENT VULNERABILITY	FLOOD ZONE A	FLOOD ZONE B	FLOOD ZONE C
Highly vulnerable	Justification Test	Justification Test	Appropriate
Less vulnerable	Justification Test	Appropriate	Appropriate
Water-compatible	Appropriate	Appropriate	Appropriate

TABLE 1 – Matrix of Vulnerability

As described above, the development falls under the highly vulnerable class and under the Flood Zone C, which is deemed ‘Appropriate’ in accordance with the OPW publication, with no justification test being necessary.

2.2 INITIAL FLOOD RISK ASSESSMENT

The purpose of the initial flood risk assessment is to ensure that all applicable flood risk issues are assessed in relation to the decisions to be made and potential conflicts between flood risk and the proposed development are addressed. It also ensures the confidence of existing site flood information and flood defences.

1. Tidal

Tidal flooding is caused by higher-than-normal sea levels, largely as a result of storm surges, resulting in the sea overflowing onto the land.

As mentioned in section 2.1, the site is not impacted by tidal levels. Thus, it is reasonable to conclude that the risk of tidal flooding is deemed to be sufficiently low to be acceptable.

2. Fluvial

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.

The site is not impacted by fluvial levels. Thus, it is reasonable to conclude that the risk of fluvial flooding is deemed to be sufficiently low to be acceptable.

3. Pluvial

In undeveloped land overland flow occurs when the amount of rainfall exceeds the infiltration capacity of the ground to absorb it. This excess water flows overland forming ponds in natural hollows. From historical records available on the OPW website there is no indication of pluvial flooding on the site.

The new development will keep the same impervious rate from the present site, and therefore there will be no increase in the discharge to the public storm drainages.

The surface water drainage network for the proposed scheme is set out in closer detail in the Engineering Infrastructure Report accompanying this planning application.

Based on the above, the risk of flooding of the proposed site from the drainage system is considered low.

4. 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 site specific factors such as tidal variations.

Upon completion of a geotechnical investigation report, the impact of groundwater can be assessed accordingly. We note that there is no historical evidence of groundwater flooding on the site extents.

5. Infrastructural

Proper operation and maintenance of the drainage system will be implemented in accordance with CIRIC 753, The SUDS Manual to reduce any risk of human or mechanical error causing flood risk from blockages.

2.3 DETAILED FLOOD RISK ASSESSMENT

The purpose of Stage 3, a detailed flood risk assessment, involves examining potential residual risks in detail and proposing measures to mitigate or eliminate the same from the identified source.

1. Check does the development increase flood risk elsewhere?

The type of cover on site will change in the proposed plan, rain falling on the site will undergo onsite treatment, and all stormwater attenuation systems will be sized based on stormwater flows that limit the flow from site to greenfield rates. Therefore, the new development will not change the outflow volume and peak outflow rate. Thus, there is no increase to flood risk elsewhere.

2. Check possibility of new surface water network flooding?

During preliminary design of the proposed storm network design, a climate change factor of 20% was applied to storm events.

3. CONCLUSION

The flood risk assessment has been carried out in accordance with the OPW Publication “The Planning System and Flood Risk Assessment Guidelines for Planning Authorities” and concludes the following:

- The site-specific flood risk assessment for the construction of the development was undertaken in accordance with the requirements of the “Planning System and Flood Risk Management Guidelines for Planning Authorities”, and other relevant documents and publications.
- The proposed type of development for this site is to be primarily residential use, which is categorized by the guidelines as highly vulnerable development. As the proposed development is in Flood Zone C, the development is deemed as ‘appropriate’, and a justification test is not required.
- The development’s drainage design includes for a 20% climate change allowance.
- There is no risk of flooding affecting the site area from tidal or fluvial sources.

- The proposed development will not increase the stormwater runoff rate when compared to the existing site and satisfies the requirement of the SFRA (Strategic Flood Risk Assessment) to reduce flooding and improve water quality.
- Any known flood events have not caused flooding of the proposed site, and the proposed development does not increase flood risk elsewhere.
- Thus, the residual risks of flooding can be managed by incorporation of good building practice in design and construction of ground floor level and associated drainage systems, and by maintenance and management of the property.

As outlined above, the proposed development has been demonstrated to be in compliance with the core objectives of the Planning System and Flood Risk Management Guidelines.