FLOOD RISK ASSESSMENT REPORT

FOR

PROPOSED WAREHOUSE DEVELOPMENT

AT

MAGNA AVENUE, MAGNA BUSINESS PARK,

DUBLIN 24

February 2022

ON BEHALF OF

ROCKFACE DEVELOPMENTS LTD.

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1 INTRODUCTION

Enviroguide Consulting (hereafter referred to as EGC) was commissioned by Rockface Developments Ltd. (hereafter referred to as the Client) to undertake a Flood Risk Assessment (FRA) for the Proposed Warehouse Development at Magna Avenue, Magna Business Park, Dublin 24 (referred to hereafter as the Site).

This report presents the findings of the FRA for the Site.

1.1 Project Objective

The project objective to determine if there is any potential flood risk associated with the Site and identify where appropriate any additional assessment and mitigation measures that would be required.

1.2 Project Scope

The FRA involved a Stage 1 and Stage 2 assessment in accordance with the approach and methodology set out in the Department of Environment, Heritage and Local Government (DEHLG) guidance: 'The Planning System and Flood Risk Management. Guidelines for Planning Authorities' (DEHLG, 2009).

The methodology and scope of work undertaken is outlined in Section 2 and the results and recommendations presented in the following sections of the report.

2 METHODOLOGY

2.1 Relevant Guidance

Relevant best practice guidance (Department of Environment, Heritage and Local Government (DEHLG), November 2009. The Planning System and Flood Risk Management Guidelines for Planning Authorities) sets out a risk based sequential approach to flood risk assessment. The three key stages are identified as follows:

- **Stage 1 - Flood Risk Identification** - To identify whether there may be any flooding or surface water management issues related to a plan area or proposed development site that may warrant further investigation;
- **Stage 2 - Initial Flood Risk Assessment** - To confirm sources of flooding that may affect a plan area or proposed development site to appraise the adequacy of existing information and to determine what surveys and modelling approach is appropriate to match the spatial resolution required and complexity of the flood risk issues. The extent of the risk of flooding should be assessed. Where existing river or coastal models exist, these should be broadly used to assess the extent of the risk of flooding, and the potential impact of the proposed development on flooding elsewhere and of the scope of possible mitigation measures; and
- **Stage 3 - Detailed Flood Risk Assessment** - To assess flood risk issues in sufficient detail and to provide a quantitative appraisal of potential flood risk to a proposed area or existing development, of its potential impact on flood risk elsewhere and of the effectiveness of any proposed mitigation measures. This will typically involve the use of an existing or construction of a hydraulic model of the river or coastal cell across a wide enough area to appreciate the catchment wide impacts and hydrological processes involved.

2.1.1 Flood Zones

The objective of an FRA is to assess all types of flood risk to a development. The assessment should investigate potential sources of flood risk and include 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.

This approach is based on the identification of flood zones for river and coastal flooding. According to best practice guidance (DEHLG, November 2009) flood zones are geographical areas within which the likelihood of flooding is in a particular range, and they are a key tool in flood risk management within the planning process. There are three types / levels of flood zones defined for the purposes of these guidelines, as presented in Table 2-1.

Table 2-1. Flood Zone Definitions

Flood Zone Definitions
Flood Zone A – where the probability of flooding from rivers and the sea is highest (greater than 1% or 1 in 100 for river flooding or 0.5% or 1 in 200 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 and 1% or 1 in 100 for river flooding and between 0.1% or 1 in 100 and 0.5% or 1 in 200 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 for both river and coastal flooding Flood Zone C covers all areas of the plan which are not in zones A or B.
*Source - Extract from DEHLG November. 2009. The Planning System and Flood Risk Management Guidelines for Planning Authorities

2.1.2 Justification Test

Once a flood zone has been identified, the guidelines set out the different types of development appropriate to each zone to determine whether the development is considered appropriate or whether a Justification Test is required (refer to Table 2-2).

The Justification Test is used to assess the appropriateness of developments in flood risk areas. The test is comprised of two processes. The first is the Plan-making Justification Test and is used at the plan preparation and adoption stage where it is intended to zone or otherwise designate land which is at moderate or high risk of flooding. The second is the Development Management Justification Test and is used at the planning application stage where it is intended to develop land at moderate or high risk of flooding for uses or development vulnerable to flooding that would generally be inappropriate for that land.

Table 2-2. Matrix of Vulnerability and Flood Zone to Illustrate Appropriate Development and that Required to Meet the Justification Test

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
*Source - Extract from DEHLG November, 2009. The Planning System and Flood Risk Management Guidelines for Planning Authorities			

2.2 Scope of Assessment

This FRA has been carried out in accordance with relevant best practice guidance (DEHLG, November 2009) and comprised the completion of the following key stages, using the phased approach:

- Stage 1 - Flood Risk Identification; and

- Stage 2 - Initial Flood Risk Assessment

The scope of works undertaken comprised of a desk-based study including review of published information for the Site, design information for the proposed development provided by the Client and a site walkover inspection and survey.

2.2.1 Site Walkover

A site walkover inspection and survey was undertaken by EGC on the 19th January 2022 to identify and assess the Site setting and receiving water bodies and assess any potential constraints in relation to Flood Risk Assessment.

2.2.2 Desk- Based Studies

This task involved undertaking a detailed review of all available desk-based information in relation to historic flooding and potential future flood risk including the following published information:

- Geological Survey of Ireland Online mapping (GSI, 2022);
- Environmental Protection Agency Online mapping (EPA, 2022);
- Office of Public Works website and Online mapping (OPW, 2022);
- Office of Public Works Eastern Catchment Flood Risk & Management Study (CFRAM, 2017);
- Office of Public Works and RPS Group Plc., June 2010. The Irish Coastal Protection Strategy Study - Phase II – South East Coast (ICPSS, 2010);
- Office of Public Works and RPS Group Plc., October 2020. Irish Coastal Wave and Water Level Modelling Study 2018. Phase 1 – Extreme Water Levels (ICWWS, 2020); and
- South Dublin County Council, January 2016. South Dublin County Council Development Plan 2016 – 2022 (SDCC, 2016-2022);

The following relevant reports and drawings in relation to the design of the Proposed Development Site were also reviewed (refer to Appendix A):

- Kavanagh Burke Consulting Engineers, January 2022. Drainage Design Report (Job No. D1720); and
- Kavanagh Burke Consulting Engineers, January 2022. Drainage and Watermain Layout (Drawing No. D3).

All available information from the desk-based studies have been evaluated and the findings are presented in this report.

3 DESCRIPTION OF THE PROPOSED DEVELOPMENT

Rockface Developments Limited intend to apply for permission for development at this 3.03 Ha site at Magna Avenue and Magna Drive, Citywest, Dublin 24. The lands are bounded to the south by Magna Avenue, to the north and west by Magna Drive and to the east by development within Magna Business Park. The building will have a maximum height of 15.5m with a gross floor area of 13,604 sq m including a warehouse area (12,568 sq m), staff facilities (498 sq m) and ancillary office area (538 sq m).

The development will also include: a vehicular and pedestrian entrance to the site from Magna Avenue, a separate HGV entrance from Magna Drive; 69 No. ancillary car parking spaces; covered bicycle parking; HGV parking and yards; level access goods doors; dock levellers; access gates; signage; hard and soft landscaping; lighting; boundary treatments; ESB substation; sprinkler tank and pump house; and all associated site development works above and below ground.

3.1 Surface Water Drainage and SUDS

The surface water drainage for the Site has been designed in accordance the Greater Dublin Strategic Drainage Strategy (GDSDS) as specified in the Drainage Design Report (Kavanagh Burke Consulting Engineers, January 2022).

In accordance with the GDSDS guidelines surface water runoff from roofs, parking areas and yard areas will be attenuated to greenfield runoff rates via a petrol interceptor and an appropriately sized attenuation tank designed for a 1 in 100year storm event (+20% allowance for climate change) together with a vortex flow control device and discharged to an existing surface water manhole located to the north of the Site along Magna Drive.

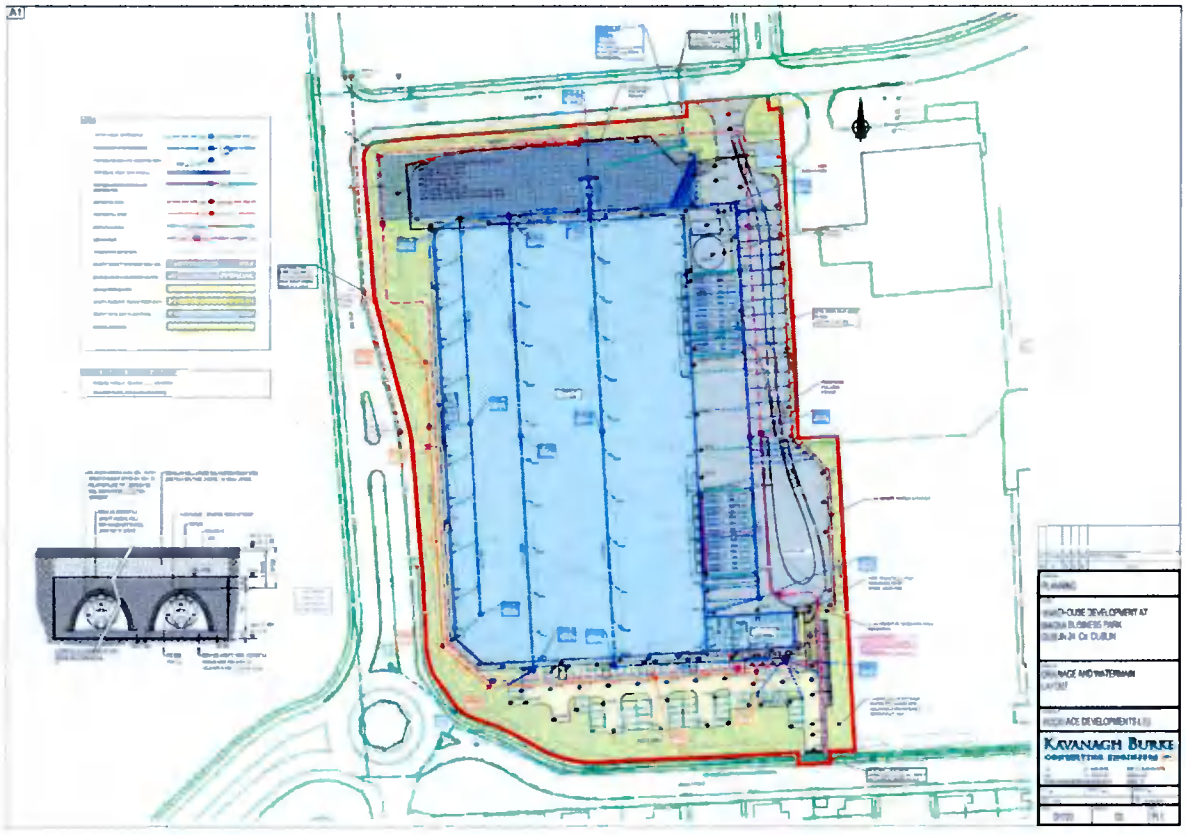
The surface water strategy for the Proposed Development will incorporate Sustainable Drainage Systems (SuDS) features to minimise the impact of the runoff on water quality and quantity and maximise the amenity and biodiversity opportunities within the Proposed Development Site. It is proposed to provide the following SuDS measures within the Proposed Development:

- Tree pits;
- Permeable paving;
- Grasscrete;
- Restricted discharge; and
- Silt trap and petrol interceptor.

There will be no direct discharges to groundwater or surface water from the Site.

The surface water drainage layout for the Proposed Development is presented in Figure 3-1 (also refer to Appendix A).

Figure 3-1. Surface Water Drainage (Kavanagh Burke Consulting Engineers, January 2022)



3.2 Foul Water

The Drainage Design Report (Kavanagh Burke Consulting Engineers, January 2022) identifies that foul water from the Site will be discharged to the existing Irish Water (IW) foul sewer network to the east of the Site along Magna Drive (refer to Figure 3-1) subject to agreement with IW.

3.3 Water Supply

The Drainage Design Report (Kavanagh Burke Consulting Engineers, January 2022) identifies that water supply to the Proposed Development will be provided from a connection to the existing IW mains supply to the south of the Site along Magna Avenue (refer to Figure 3-1) subject to agreement with IW.

4 Site Description and Proposed Development

4.1 Site Location and Description

The Site is located at Magna Avenue, Magna Business Park, Dublin 24.

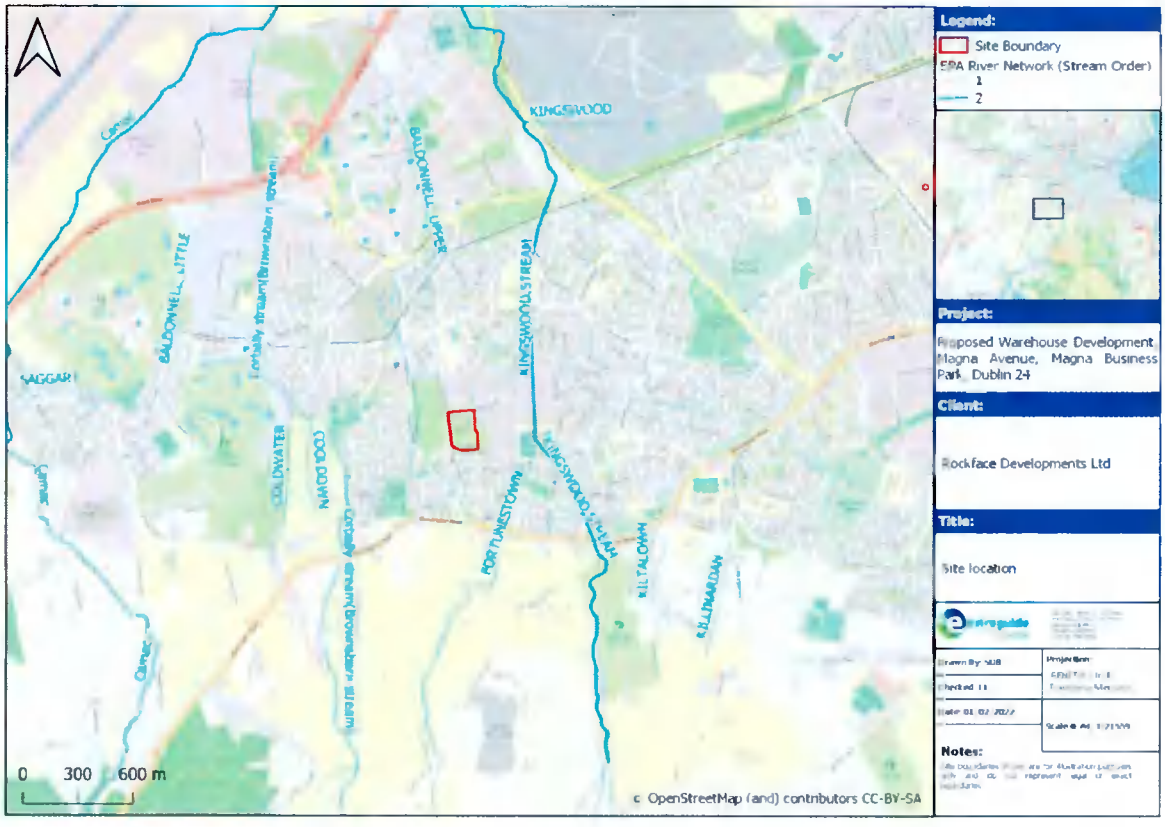
The Site is 3.02 hectares (Ha) and comprises greenfield lands. The Site is bound to the south by Magna Avenue, to the north and west by Magna Drive and to the east by commercial warehouses within the Magna Business Park.

The Proposed Development Site is within lands that are zoned 'C2.1 - Industrial, Enterprise, Employment' under the South Dublin County Council Development Plan 2016-2022 (SDCC 2016-2022).

The Site is located within an urban setting with the surrounding lands comprising commercial and residential land uses.

The Site location is presented in Figure 4-1.

Figure 4-1. Site Location



4.2 Topography

The topographical survey of the Site indicated that the overall topography ranges from approximately 127.1 meters above ordnance datum (mOD) in the south to 119.25mOD in the north.

4.3 Hydrology

The Site is mapped by the EPA (EPA, 2022) as within the WFD Catchment of the Liffey and Dublin Bay, Hydrometric Area (HA09), the Liffey_SC_090 Sub-catchment (Sub-catchment I.D.: 09_15) and the Camac_020 / Camac_030 WFD River Sub Basin (European Code: IE_EA_09C020250 / IE_EA_09C020310).

The closest surface water features are named locally and recorded on the EPA database (EPA, 2022) as the Boherboy Stream (River Waterbody Code: IE_EA_09C020250) located approximately 0.12km west of the Site. The Boherboy Stream converges with the Baldonnell Upper River (River Waterbody Code: IE_EA_09C020250) approximately 0.18km west of the Site.

The Kingswood Stream (River Waterbody Code: IE_EA_09C020310) and the Corbally Stream (River waterbody Code: IE_EA_09C020250) which are located approximately 0.32km east and 0.59km west of the Site respectively.

The Baldonnell Upper River, the Kingswood Stream and the Corbally Stream flow northwards before converging with the Camac River (River Waterbody Code: IE_EA_09C020250) located approximately 2.3km north of the Site and discharging to the Liffey Estuary Upper (European Code: IE_EA_090_0400) located approximately 11.1km northeast of the Site.

The Irish Sea is located approximately 14.7km west of the Site.

The local surface water features within the vicinity of the Site are presented in Figure 4-1.

4.4 Soil and Geology

The soils beneath the Proposed Development Site have been mapped by Teagasc (Teagasc, 2022) as moderately drained fine loamy drift with limestones of the Elton (1000x) soil series.

The subsoils or quaternary sediments beneath the Proposed Development Site are mapped by the GSI (GSI, 2022) as 'till derived from limestones' (TLs).

The bedrock beneath the Site is mapped as the Lucan Formation (Stratigraphic Code: LU; New Code CDLUCN) which is comprised of dark-grey to black, fine-grained, occasionally cherty, mictric limestones that weather paler, usually to pale grey from the lower Carboniferous period. There are rare dark coarser grained calcarenitic limestones, sometimes graded, and interbedded dark-grey calcar. The formation ranges from 300m to 800m in thickness (GSI, 2022).

4.5 Hydrogeology

The GSI (GSI, 2022) has classified the bedrock of the Lucan Formation beneath the Proposed Development Site and surrounding area as a Locally Important Aquifer (Ll) (i.e. bedrock which is moderately productive only in Local Zones.

The GSI have assigned a groundwater vulnerability rating of "Low (L)" for the groundwater beneath the Site (GSI, 2022) indicating greater than 10m of low permeability overburden.

The GSI (GSI, 2022) has calculated an Effective Rainfall (ER) value of 510.4mm/year across the Site. Taking account of the soil drainage, subsoil permeability, thickness and type, the ability of the aquifer to accept the recharge, and rainfall, the GSI (GSI, 2022) have identified a

groundwater recharge coefficient of 7.5% of effective rainfall with a calculated average capped recharge of 38mm/year. Given the greater than 10m thickness of low permeability overburden across the Site and Low vulnerability, it is considered that there is a limited capacity of the aquifer at the Site to accept recharge via infiltration of rainfall.

5 STAGE 1 - FLOOD RISK IDENTIFICATION

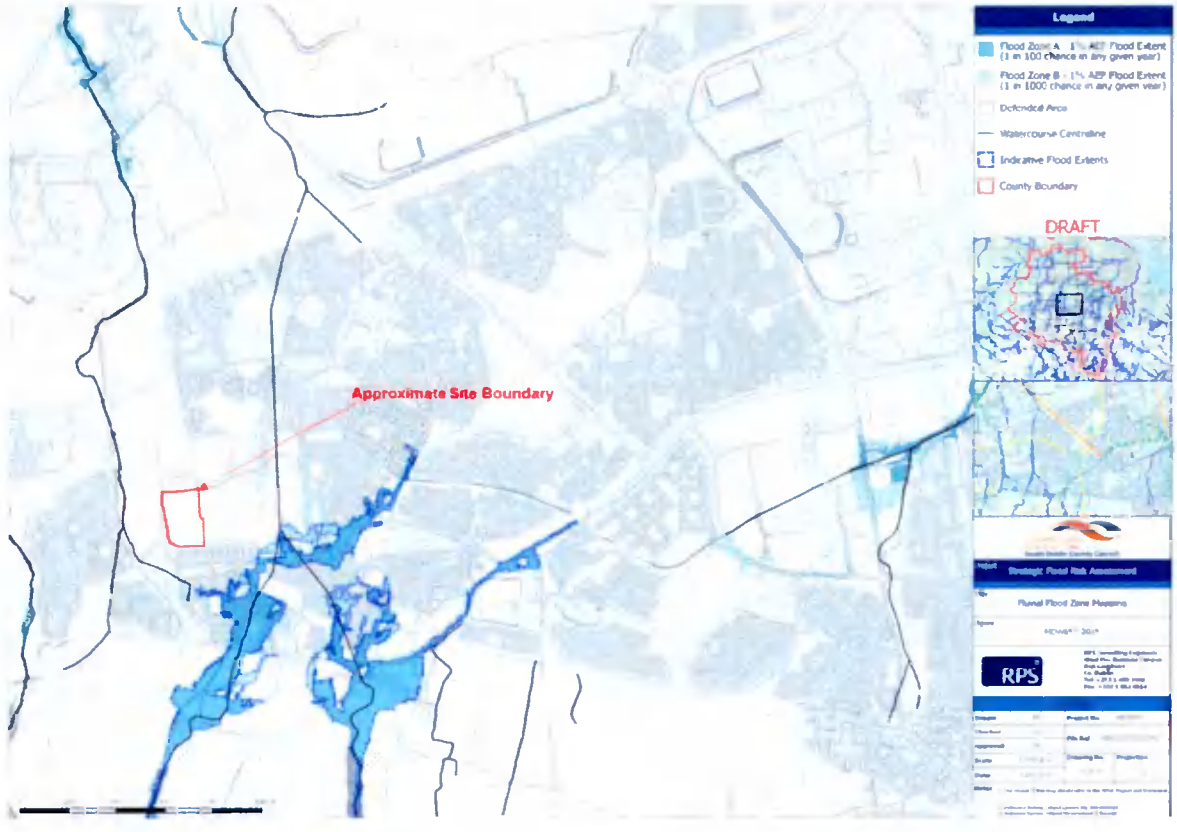
5.1 Strategic Flood Risk Assessment

The Strategic Flood Risk Assessment (SFRA), which was prepared to accompany the SDCC, 2016-2022 Development Plan. assesses all the types of flood risk within the SDCC jurisdiction area, identifying principal rivers and sources of flooding, producing flood maps, assessing potential impacts of climate change, and identifying the location of any flood risk management infrastructure. The Development Plan also states: '*It is the policy of the Council to continue to incorporate Flood Risk Management into the spatial planning of the County, to meet the requirements of the EU Floods Directive and the EU Water Framework Directive.*'

5.1.1 Fluvial Flooding

Fluvial flood mapping published in the SFRA (SDCC, 2016-2022) identifies that the Site is located outside of the the 10% AEP, 1%AEP and 0.1% AEP flood extents for fluvial flooding of the Camac River and it tributaries (i.e., the Boherboy Stream, the Baldonnell Upper River, the Kingswood Stream and the Corbally Stream) (refer to Figure 5-1).

Figure 5-1. Fluvial Flood Mapping (SDCC, 2016-2022)



5.1.2 Coastal Flooding

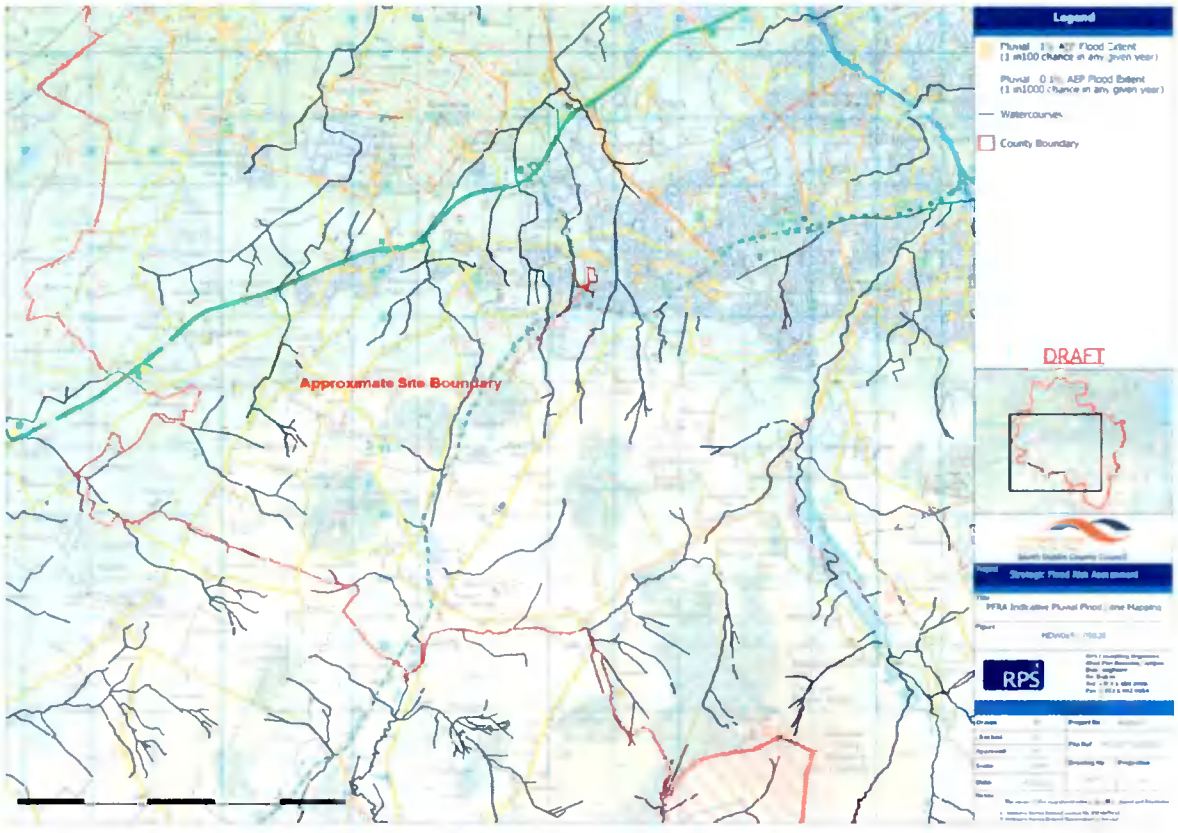
As document in the SFRA (SDCC, 2016-2022), coastal flooding is not a concern for SDCC as it is a landlocked county.

Tidal surging of surface water is addressed in the Irish Coastal Protection Strategy Study (ICPSS, 2010) and the Eastern Catchment Flood Risk Assessment and Management (CFRAM. 2017) maps (refer to Sections 5.2 and 5.3 respectively).

5.1.3 Pluvial Flooding

Pluvial flood mapping published in the SFRA (SDCC, 2016-2022) identifies that the Site is not within an area at risk of the 10% AEP, 1%AEP and 0.1% AEP flood extents for pluvial flooding (refer to Figure 5-2).

Figure 5-2. Pluvial Flood Mapping (SDCC, 2016-2022)



5.2 Irish Coastal Protection Strategy Study

5.2.1 Coastal Flooding

Coastal flood mapping published by the Office of Public Works and RPS Group Plc. (ICPSS, 2010 and ICWWS, 2020) was consulted, and identifies that coastal flooding does not extend upstream as far as the Site along the Camac River and its tributaries.

5.3 Eastern CFRAM Predictive Flood Risk Mapping

The Eastern Catchment Flood Risk Assessment and Management (CFRAM) study commenced by the OPW in the eastern district in June 2011 through to the end of 2016. The study is focusing in the areas known to have experienced flooding in the past and areas that may be subject to flooding in the future, either due to development pressures or climate change.

5.3.1 Fluvial Flooding

Fluvial flood mapping published by the OPW as part of the Eastern CFRAM Programme was consulted (CFRAM, 2017) and the Site is identified to be outside the 10% AEP, 1%AEP and 0.1% AEP flood extents for fluvial flooding along the Camac River and its tributaries (refer to *Figure 5-3* and *Figure 5-4*).

Furthermore, the Site is also located outside the flood extents for the for High End Future Scenario (HEFS) which takes into account the potential impacts of climate change (i.e., 30% rainfall) and other possible future changes.

Figure 5-3. Fluvial Flood Mapping (CFRAM, 2017 – E09CAM_EXFCD_F1_06)

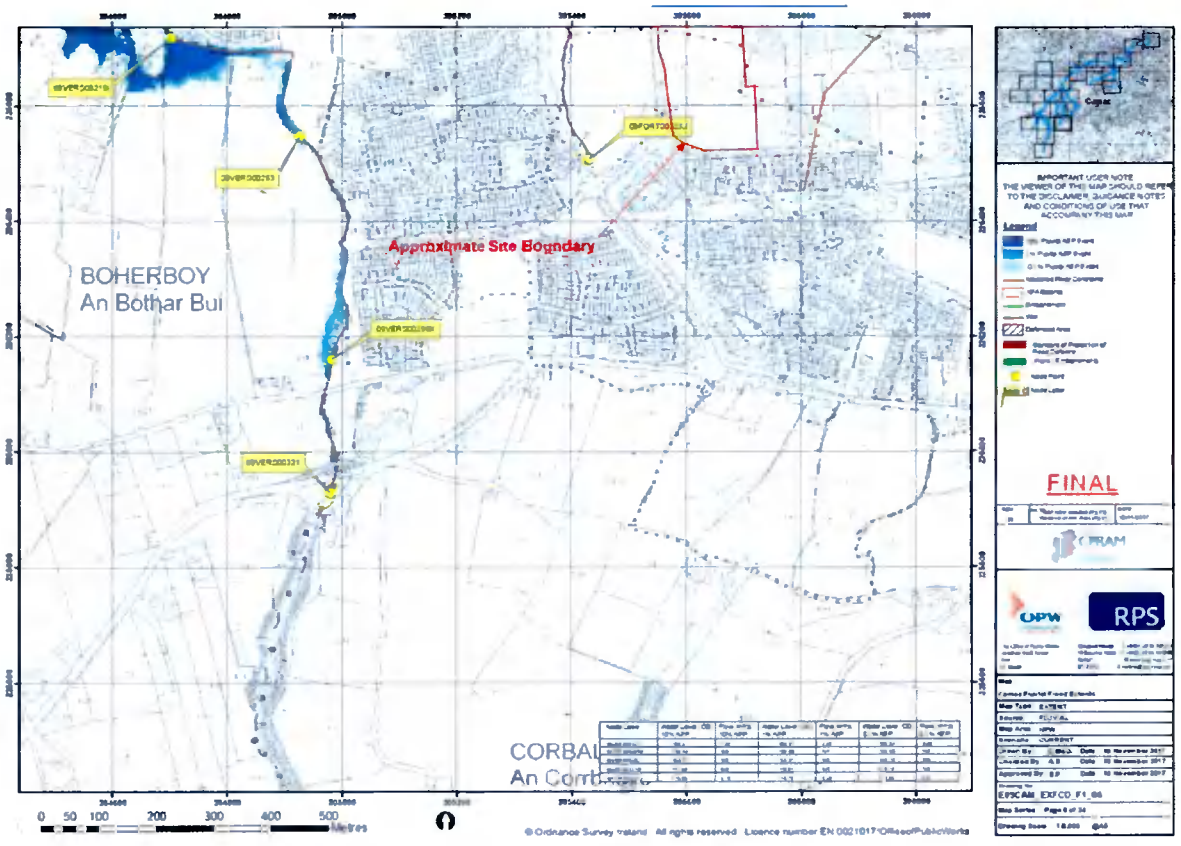
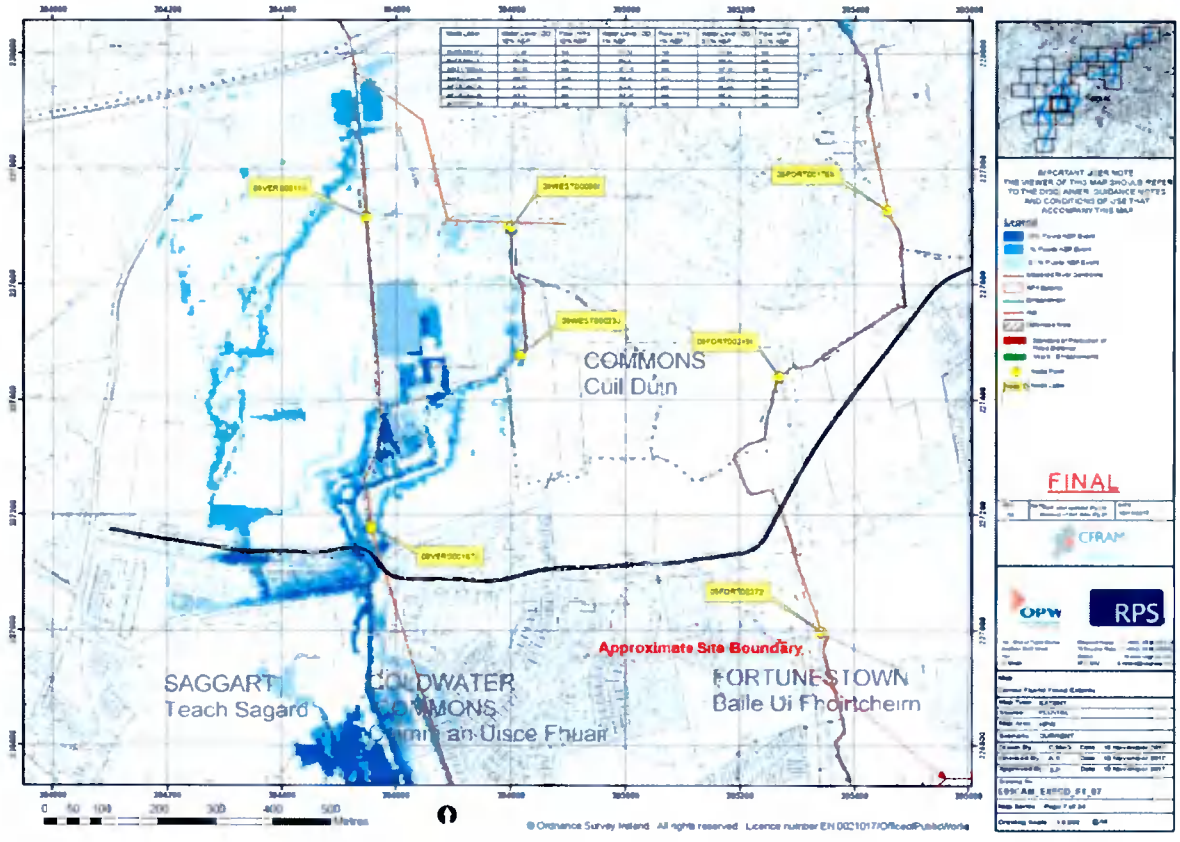


Figure 5-4. Fluvial Flood Mapping (CFRAM, 2017 - E09CAM_EXFCD_F1_07)



Predicted flood levels were also extracted from the CFRAM, 2017 Fluvial Flood Maps (refer to *Figure 5-3* and *Figure 5-4*) at node locations 09FORT00323J and 09FORT002721 located on the Baldonnell Upper River approximately 0.15km west and cross gradient and 0.22km northwest and downgradient of the Site respectively(refer to Table 5-1).

The proposed Site levels are 3.92m above the maximum predicted flood water levels for 0.1% AEP and therefore not at risk of flooding.

Table 5-1. Predicted Flood Levels (CFRAM, 2017)

Node Label	Water Level (mOD) 10% AEP	Water Level (mOD) 1% AEP	Water Level (mOD) 0.1% AEP	Proposed Site Level (mOD)
09FORT00323J	118.66	118.76	118.88	122.8
09FORT002721	112.87	112.9	112.94	

5.3.2 Pluvial Flooding

Pluvial flood mapping published by the OPW as part of the Eastern CFRAM Programme was consulted (CFRAM, 2017) was consulted, however, there is no mapped information for the Site.

5.3.3 Coastal Flooding

Coastal flood mapping published by the OPW as part of the Eastern CFRAM Programme was consulted (CFRAM, 2017) was consulted, however, there is no mapped information for the Site.

The Site is located outside the flood extents for the for High End Future Scenario (HEFS) which takes into account the potential impacts of climate change and other possible future changes.

5.4 Geological Survey of Ireland

5.4.1 Groundwater Flooding

The GSI groundwater flood maps (GSI, 2022) did not identify any potential groundwater flood risk at the Site.

There are no identified or recorded karst landforms features (enclosed depressions, turloughs, springs etc.) identified at the Site or within a 2km radius of the Proposed Development Site (GSI, 2022).

5.5 National Flood Hazard Mapping

The OPW national flood hazard mapping (NFHM) (OPW, 2022) was consulted to obtain reports of recorded flooding within 2km radius of the Site. The NFHM database lists two (2No.) reoccurring flood events and eight (8No.) single flood events within a 2km radius of the Proposed Development Site and the closest is 0.41km from the Site(refer to Table 5-2).

Table 5-2. Recorded Flood Events within 2km

Flood I.D.	Flood Type	Flood Event	Date (dd/mm/yyyy)	Distance (km)
3322	Single	Jobstown N81	05/11/2000	0.45km south
11672	Single	Belfry Drive/De Selby Park, Dublin 24	23/10/2011	0.41km south
11745	Single	Blessington Road, Tallaght, Dublin 24	01/05/2012	1.05km east
11657	Single	Tallaght Pass, N81, Dublin 24	23/10/2011	1.80km east
1253	Recurring	Killinarden Stream, N81, Jobstown	-	1.76km east
1186	Recurring	Killinarden Stream, N81, Jobstown	-	1.02km east
11673	Single	Bawnlea Crescent and Avenue, Tallaght, Dublin 24	23/10/2011	0.85km east
3321	Single	Fortunestown Lane	06/11/2000	0.5km northwest
11600	Single	Fortunestown Lane, Citywest, Co. Dublin	23/10/2011	1.09km northwest
11601	Single	Garter Lane, Saggart, Co. Dublin	23/10/2011	1.98km west

There are no recorded historic flood events of hazards recorded for the Proposed Development Site.

6 STAGE 2 – INITIAL FLOOD RISK ASSESSMENT

6.1 Appraisal of the Availability and Adequacy of Existing Information

Based on the findings of the desk-based assessment and taking account of additional available information (refer to Section 5) it is considered that there is sufficient technical information to complete the Initial Flood Risk Assessment for the Site.

6.2 Evaluation of Potential Sources of Flooding

The types of flooding sources which could potentially affect the Proposed Development have been evaluated and are discussed below.

6.2.1 Fluvial Flood Risk

The Site is located outside the mapped potential fluvial flood extents is identified to be outside the 10% AEP, 1%AEP and 0.1% AEP flood extents for fluvial flooding.

The proposed finished floor levels at the Site were compared to the predicted 10% AEP, 1%AEP and 0.1%AEP flood levels at Node 09FORT00323J located on the Baldonnell Upper River located approximately 0.15km west and cross gradient of the Site.

The proposed finish floor level at the Site (122.8mOD) are set to 3.92m above the 0.1% AEP flood levels (118.88mOD). Therefore, it is considered that there will be no risk associated with fluvial flooding at the Site of the proposed development.

Furthermore, given that the Site is located outside the flood extents for the HEFS and given a freeboard of 3.92m above the 0.1% AEP, it is considered that should the effects of climate change be realised, it is anticipated that there will be no risk associated with fluvial flooding at the Site.

6.2.2 Coastal Flood Risk

The SFRA (SDCC, 2016-2022) has not identified any risk of flooding to the Site given that it is located within a landlocked county.

Coastal flood mapping (ICPSS, 2010, ICWWS, 2020 and CFRAM, 2017) was consulted, and identifies that coastal flooding does not extend upstream as far as the Site along the Camac River and its tributaries.

Furthermore, given the distance of the Site from the Irish Sea (i.e., 14.7km) and the fact that the finished floor levels for the Site (i.e., 122.8mOD) will be significantly higher than any expected coastal flood levels, there is no risk associated with coastal flooding at the Site.

6.2.3 Pluvial Flood Risk

Pluvial flood maps were consulted (SDCC, 2016-2022 and CFRAM, 2017) and there was pluvial flood risk identified at the Site.

Generally, in order for a site to be considered at risk from surface water flow it characteristically has steep gradients either within or above the site and a reasonably large contributing catchment area. The proposed development site is relatively flat with a gentle slope towards northern Site boundary. In addition, the lands surrounding the Site are generally level with no

significant slopes. Therefore, the risk of significant flooding from overland flow would be considered low.

The surface water drainage design for the Proposed Development has been designed to cater for storm water runoff from impermeable areas, within the proposed development, in accordance with the GDSDS and will contain the 1 in 100-year event plus 20% climate change allowance.

Furthermore, surface water runoff from roofs, parking areas and yard areas will be attenuated to greenfield runoff rates via an appropriately sized attenuation tank and vortex flow control device prior to discharging to the existing surface water manhole located to the north of the Site along Magna Drive.

Therefore, taking account of the design of the surface water drainage at the Proposed Development, it is considered that there will be no risk of pluvial flooding at the Site or elsewhere as a result of the proposed development.

6.2.4 Groundwater Flood Risk

There are no historical records of groundwater flooding at the Proposed Development Site which not within an area mapped with potential for groundwater flooding (GSI, 2022).

There are no identified or recorded karst landforms features (enclosed depressions) identified at the Site or within a 2km radius of the Proposed Development Site (GSI, 2021) and the absence of depressions / groundwater seeps or springs was verified during the site walkover survey. Therefore, taking account of the hydrogeological setting of the Site, the potential risk of groundwater flooding is considered low.

6.3 Flood Risk Evaluation

Based on the available published data and an assessment of potential sources of flood risk, the Proposed Development Site is located within Flood Zone C where the probability of coastal or fluvial flooding is low.

There is no identified risk of pluvial flooding at the Site taking account of the existing conditions and the design proposals for surface water management at the Site.

The Site is not within an area at risk of groundwater flooding.

Overall, the Site is located within an area where potential risk of flooding is low.

7 ASSESSMENT FOR APPROPRIATE DEVELOPMENT

7.1 Flood Zone for the Proposed Development

Following a review of the available data, it is considered that the Proposed Development Site is located within Flood Zone C , where the probability of flooding from rivers and the sea is low (less than 0.1% or 1 in 1000 for both river and coastal flooding).

7.2 Vulnerability Class of Development

The proposed development at the Site comprises the construction of a warehouse with ancillary offices and staff facilities and is therefore considered a 'less vulnerable development' in accordance with Table 3.1 of the DEHLG. November 2009 guidelines (refer to Table 7-1 below).

Table 7-1: Classification of Vulnerability of Different Types of Development

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); Lifeguard and coastguard stations; Amenity open space, outdoor sports and recreation and essential facilities such as changing rooms; and Essential ancillary sleeping or residential accommodation for staff required by uses in this category (subject to a specific warning and evacuation plan).
*Uses not listed here should be considered on their own merits	
*Source - Extract from DEHLG November, 2009. The Planning System and Flood Risk Management Guidelines for Planning Authorities	

7.3 Evaluation of Appropriate Development

The Proposed Development Site is within lands that are zoned 'C2.1 - Industrial, Enterprise, Employment' under the SDCC 2016-2022 Development Plan. As such, the proposed development at the Site is deemed suitable for the policies and objectives assigned to this area.

The Proposed Development Site is within Flood Zone C the Proposed Development a **'less vulnerable development'** in accordance with Table 3.1 of the DEHLG, 2009 guidelines. Therefore, in accordance with Table 2-2 the proposed development is considered 'Appropriate' for the Site and a Justification Test is not required.

8 CONCLUSIONS

EGC has completed an FRA in accordance with the guidelines set out in 'The Planning System and Flood Risk Management – Guidelines for Planning Authorities' (DEHLG, November 2009) and based on the findings of the assessment the following can be concluded:

- The Proposed Development is for the construction of a proposed warehouse development including ancillary offices and staff facilities at Magna Avenue, Magna Business Park, Dublin 24.
- The Proposed Development is considered to be a 'less vulnerable development' in accordance with Table 3.1 of the DEHLG, 2009 guidelines.
- The Proposed Development Site is located within Flood Zone C and not at risk of fluvial, tidal / coastal, pluvial or groundwater flooding.
- There is no identified risk of flooding elsewhere associated with the Proposed Development.
- The Proposed Development is considered Appropriate in accordance with guidelines set out in 'The Planning System and Flood Risk Management – Guidelines for Planning Authorities' (DEHLG, November 2009).

9 REFERENCES

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