

Tel: 0419842378 Mob: 0877905155

Environmental Consultants Unit 8, Duleek Court, Duleek, Co. Meath A92 EN27

Email: info@hydrocare.ie

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Dublin City Council, Planning Section, Civic Offices, Wood Quay, Dublin 8, D08 RF3F

Applicant: EW Property Limited

To whom it concerns,

Hydrocare Environmental Ltd has been contracted by the applicant to issue a Site-Specific Flood Risk Assessment Report for a Strategic Housing Development planning application at Hartfield Place, Swords Road, Whitehall, Dublin 9.

The proposed development is for a LRD Application for amendments to permitted development ABP 313289-22 for Apartments, Creche and Associated Works at a site at 'Hartfield Place', Swords Road, Whitehall, Co. Dublin. The proposed amendments include the replacement of the permitted basement with a semi-basement under blocks D, E and part of the communal open space. The amendments will result in a change in height to all blocks, alteration to and reduction of the number of car parking spaces on site, alteration to the cycle parking locations, and changes to the open space layout. Amendments to the internal layout of Blocks A, B, C, D & E resulting in the increase in the total number of units by 29 units, with an overall total of 334 units.

Refer to the SSFRA report included herewith.

Yours sincerely,

Daniel Nolan, MIEI, BA BAI, MSc Environmental Engineering, FETAC Site Assessor

SITE SPECIFIC FLOOD RISK ASSESSMENT

Hartfield Place SHD Whitehall, Swords Road, Dublin 9

Date of Report: 19/09/2024

Prepared By:



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Adrian Bacaoanu, MSc Sustainable Energy Engineering, BSc Applied Physics Daniel Nolan, BA BAI, MSc Environmental Engineering, FETAC Site Assessor, MIEI

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DISCLAIMER

This Site-Specific Flood Risk Assessment (SSFRA) Report is carried out based on available information at the time of writing. All flood water levels identified in this report are predicted flood water levels based on computational models which are recommended for use by local authorities, government organisations and industry leaders as tools to establish flood risk. All models used are accurate based only on the variables used in compiling the models and are not to be used as a precise representation of flood water levels and flood extents. As a result, flood water levels and extents may differ in an actual flood event compared to any modelled flood event.

This SSFRA and hydraulic flood model are relevant only to the subject site. The flood mapping produced by the hydraulic model and shown in this report must not be utilised to assess flood risk or influence planning decisions for neighbouring developments.

1.0 INTRODUCTION

1.1 Site Context & Location

The subject site is located at Swords Road, Whitehall, Dublin 9 ca. 3.5km North of Dublin City Center. The site is located 5km from the eastern coastline. The proposed site location can be seen on the OSI Discovery Map in Figure 1 below.



Figure 1 – Site Location. OSI Discovery Map

The proposed site currently exists as a greenfield site within the confines of Dublin City, at Swords Road, Whitehall, Dublin 9. To the north of the proposed development site is a green area and a football playing field. To the west of the proposed development is the public road Swords Road, beyond which is an existing residential housing estate. East of the proposed site is an existing apartment complex and existing residential housing estate. South of the proposed development is the Highfield Healthcare Centre. The Dublin Port Tunnel runs under the proposed development site.

1.2 Proposal Description

LRD Application for amendments to permitted development ABP 313289-22 for Apartments, Creche and Associated Works at a site at 'Hartfield Place', Swords Road, Whitehall, Co. Dublin. The proposed amendments include the replacement of the permitted basement with a semi-basement under blocks D, E and part of the communal open space. The amendments will result in a change in height to all blocks, alteration to and reduction of the number of car parking spaces on site, alteration to the cycle parking locations, and changes to the open space layout. Amendments to the internal layout of Blocks A, B, C, D, & E resulting in the increase in the total number of units by 29 units, with an overall total of 334 units.

A full description of the development is provided in the statutory notices with the application. The proposed site layout can be seen below in Figure 2. A scaled site layout drawing has been included with this report.



Figure 2 - Proposed Site Layout

1.3 Approach to SSFRA

In accordance with *The Planning System & Flood Risk Management Guidelines for Planning Authorities, DOEHLG & OPW (Nov 2009),* a Site-Specific Flood Risk Assessment (SSFRA) has been undertaken for the subject site and proposed development. The guidelines state site-specific flood risk assessments should be undertaken in stages, with the need for progression to a more detailed stage dependent on the outcomes of the former stage until the level of detail of the FRA is appropriate to support the planning matter. In this case a decision on an individual planning application. These stages progress from Level 1 to Level 2 to Level 3.

Level 1 is Flood Risk Identification and is carried out for all proposed developments and is essentially a desktop exercise to identify whether there are any potential flooding impacts that may affect the subject site. If any potential flood impacts are uncovered, further investigation is required.

Level 2 is an Initial Flood Risk Assessment which will analyse all available flooding data pertaining to the proposed development site. This will include all OPW & DCC flood mapping, local area knowledge from people within the community, surveyed site topography, soil mapping and any other useful data. It will be established at Level 2 stage if the site is suitable for development based on the available information or if further detailed assessment is necessary.

Level 3 is a Detailed Flood Risk Assessment. A high-level of detailed analysis is required with catchment runoff calculations and hydraulic modelling provided to describe and establish the potential flooding levels and their impact to the proposed development. An appraisal of potential flood risk to the proposed development, of its potential impact on flood risk elsewhere and of the effectiveness of any proposed mitigation measures should be undertaken and the findings clearly set out, together with any recommendations.

The following guidance documents have been used in the preparation of this report:

- The Planning System and Flood Risk Management Guidelines for Planning Authorities (November 2009) DOEHLG and OPW
- Planning Policy Guidelines for Flooding OPW
- Development and Flood Risk. Guidance for the Construction Industry CIRIA C624
- Strategic Flood Risk Assessment for Dublin City Development Plan 2016 2022
- Strategic Flood Risk Assessment for Dublin City Development Plan 2022 2028

2 LEVEL 1 – FLOOD RISK IDENTIFICATION

2.1 Dublin County Council Flood Map

The Strategic Flood Risk Assessment for Dublin City Development Plan 2022 - 2028 Appendix E contains the Composite Flood Zone Map. Per the Dublin City Development Plan 2022 - 2028, "the accuracy of the flood extent may vary across the study area depending on the origin and quality of available data, but the best available or readily derivable information has been used to form the composite map".

The composite flood map indicates that the proposed site is located within an area that is not susceptible to flooding, i.e. the proposed development site is indicated to be located in Flood Zone C, see Figure 3 below.



Figure 3 – Dublin City Council Composite Flood Map

3 LEVEL 2 – INITIAL FLOOD RISK ASSESSMENT

3.1 Potential Sources of Flooding

The flood risk assessment requires an awareness of the Source-Pathway-Receptor Model. The Source is where the water comes from. In Ireland, the main sources of flooding are due to extensive rainfall or higher than average sea levels. The Pathway is how and where flood waters flow, which can include rivers, drains, sewers, overland flow and river or coastal floodplains and their associated defences. Lastly, the Receptors are the vulnerable people, their buildings and property and the environment which may be affected by flooding. All three elements must be examined as part of the flood risk assessment including the vulnerability and exposure of receptors to determine its potential consequences.



Figure 4 – Example of Source Pathway Receptor Model. Source: Flood Risk Management Guidelines

3.2 Classification of Flood Zones

The Planning System and Flood Risk Management - Guidelines for Planning Authorities (November 2009) - DOEHLG and OPW identifies Flood Zones as follows:

"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 1000 year 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."

3.3 Vulnerability Classification

This SSFRA is for a LRD Application for amendments to permitted development ABP 313289-22 for Apartments, Creche, Cafe and Associated Works at a site at 'Hartfield Place', Swords Road, Whitehall, Co. Dublin. The proposed amendments include the replacement of the permitted basement with a semi-basement under blocks D, E, and part of the communal open space. The amendments will result in an increase in height of blocks D, E, and B, alteration to and reduction of the number of car parking spaces on site, alteration to the cycle parking locations, and changes to the open space layout. Amendments to the internal layout of Blocks A, B, C, D, & E resulting in the increase in the total number of units by 29 units, with an overall total of 334 units.

This is considered to be highly vulnerable development per Table 3.1: of *The Planning System and Flood Risk Management Guidelines for Planning Authorities – November 2009.* Figure 5 below is a section of Table 3.1 which describes what is classified as highly vulnerable development.

Highly vulnerable	Garda, ambulance and fire stations and command centres required to be operational during flooding;
development (including	Hospitals;
essential infrastructure)	Emergency access and egress points;
initia di adtaro/	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.

Figure 5 - Classification of Highly Vulnerable Development

3.4 Fluvial Sources

The EPA Envision Mapping Portal notes that there are no watercourses local to this development site. The nearest fluvial source to the proposed development site is located ca. 1.5km to the south and is therefore not considered to be a source of fluvial flooding to the proposed development site.



Figure 6 - Site Location & River Catchment. EPA ENVISION MAP

3.4.1 Historic Fluvial Sources Mapping

The OSI Historic Map 25 inch (1888 – 1913) indicates that a watercourse, historically flowed north of the proposed development site in a west to east direction. No evidence of this watercourse could be seen in recent observations of the proposed development site. Public stormwater drainage records do not indicate that the watercourse has been piped and channelled underground. Please refer to OSI Historic Map 25 inch (1888 – 1913) in Figure 7 below.



Figure 7 - OSI Historic Map 25 inch (1888-1913)

3.5 Pluvial Sources

The Strategic Flood Risk Assessment for Dublin City Development Plan 2022 – 2028 Appendix F contains the Dublin City Type 1 Pluvial Flood Depth Map. "Information on pluvial flood risk comes from the EU Interreg IVB FloodResilientCity Project. For the project, a City–wide Model provided a high level assessment of pluvial flood risk across Dublin and five 'Pilot Areas' (Georges Quay, Carrickfoyle Terrace, Marino & Fairview, Kippure Park and East Wall) were identified for further detailed investigation of potential pluvial flood risk i.e. Type 2 modelling."

The Type 1 Model Pluvial Flood Depth Map indicates that parts of the proposed development site are susceptible to pluvial flooding of varying depths between 0.1m to 0.5m. The proposed development has the same overall layout as the permitted development particularly with reference to the southwest corner and Swords Road. The amendment will maintain the status quo as the permitted development and there are no buildings proposed in the location of the pluvial flooding.

A stormwater drainage design has been proposed for the development site which will cater for the surface water generated on-site and which will manage and reduce the potential for pluvial flooding. This will be analysed further on in this report. Please see the pluvial flood mapping in Figure 8 below.



Figure 8 - Dublin City Type 1 Pluvial Flood Depth Map

3.6 Coastal Source

The subject site is located ca. 5km from the eastern coastline and the Irish Sea and it has an average ground level datum of ca. 42.00mAOD. The Dublin City Council Composite Flood Map shown above in Figure 3 does not indicate the proposed development site to be at risk coastal or fluvial flooding. The proposed development site is considered to be located in Flood Zone C with regard to coastal flooding. Coastal flood risk has been screened out. This development site is not considered at risk of coastal flooding.

3.7 Artificial Drainage Systems

Drainage at the proposed development site will comprise of dedicated surface water and foul water drainage systems, each discharging to the existing public surface water and foul water drainage networks respectively.

The approved surface water network under the SHD 313289-22 consisted of two separate networks with two different outfalls. Each network consisted of storm drainage, slung drainage from basement roof slab, basement drainage system, SUDS features, an attenuation system, downstream defender and a Hydrobrake. The SUDS features were made up of bioretention areas, green roofs, permeable paving & filter drains. The total attenuation storage provided was 1690m³. The total discharge rate for

the site was 5.6l/s which equates to 2l/s/ha. The discharge for the outfall onto the Swords Road was restricted to 1.6 l/s as from the GDSDS 2031 System Performance Assessment Report, the 300mm DIA public surface water main was found to be under the risk of surcharging. The discharge for the outfall into High Park was restricted to 4.0 l/s.

The proposed surface water system will remain largely the same as the previously approved system. The SHD permitted stormwater outfalls and SHD permitted attenuation volume will remain unchanged (note impermeable areas are less than the permitted SHD due to the reduction in the size of the basement area). The surface water network will connect to a new manhole which will be installed on the existing 300mm DIA storm main in the Swords Road. The surface water outfall to Swords Road will have a discharge rate of 1.6l/s which is the same as the existing planning. The outfall discharging to the existing surface water main in High Park will connect to an existing manhole and will have a discharge rate of 4.0l/sec. A non-return valve is included on the two stormwater drainage outlets to ensure no surcharging of the internal storm sewer from the public road drainage.

The proposed revised design has been accepted in principle by Dublin City Council. The surface water layout was issued formally to Dublin City Council as part of the pre-commencement compliance to condition 8 of the extant planning conditions and subsequently been accepted in principle. Refer to JOR Consulting Civil & Structural Engineers, Engineering Service Report issued as a separate document Doc. No. HARTPL-JOR-SM-ZZ-RP-C-9050_A.

3.8 Source – Pathway – Receptor – Risk

The potential flood sources are analysed for the potential risk to the subject site should a flood event occur. See Table 1 below.

Possible Source	Possible Pathway	Possible Receptor	Likelihood	Consequence	Magnitude of Risk to Subject Site
Fluvial	Overtopping	Site, Structures, & People	Not Possible	High	Low
Fluvial	Sewers via backflow/surcharge	Site, Structures, & People	Not Possible	High	Low
Artificial Drainage Systems	Foul & Storm Sewers	Site, Structures, & People	Possible	Low to Medium	Low to Medium
Coastal	Overland Sheet Flow	Site, Structures, & People	Not Possible	High	Low
Coastal	Sewers via backflow/surcharge	Site, Structures, & People	Not Possible	High	Low
Pluvial	Accumulations from Runoff	Site, Structures, & People	Possible	Low to Medium	Low to Medium
Pluvial	Sewers via backflow/surcharge	Site, Structures, & People	Possible	Low to Medium	Low to Medium

Table 1 – Source, Pathway, Receptor & Risk Factors

3.9 Previous Flood History

3.9.1 Historical Records



Figure 9 - OPW Flood Hazard Mapping

The OPW Flood Hazard map indicates that there is no history of past flood events at the proposed development site location. The closest identified past flood event is located ca. 1.4 km west of the proposed development site and ca. 1.5km south of the proposed development site. A past Flood Event Local Area Summary Report which highlights all the locations of past flood events within a 2.5km radius of the proposed development site has been appended with this report.

3.10 Flood Hazard & Risk Mapping

3.10.1 Dublin County Council – Flood Map

The DCC Composite Flood Map shown above in Figure 3 indicates that the proposed development site is located entirely outside the 1% AEP and 0.1% AEP fluvial and coastal flood extents.

Consulting the OPW PFRA Integrated Map_238 reveals that the proposed development site is not located within an area susceptible to fluvial or tidal flooding. Per the Strategic Flood Risk Assessment for Dublin City Development Plan 2022 – 2028, "The OPW's National Indicative Fluvial Mapping (NIFM) and Preliminary Flood Risk Assessment (PFRA) mapping (now obsolete) provides indicative flood extents for fluvial, coastal, groundwater and surface water risks; however, the NIFM was not used in

developing the Flood Zone map for the City SFRA as there were more detailed studies in Dublin City". The PFRA Integrated Map_238 can be seen in Appendix A of this report.

The CFRAM fluvial and tidal flood extents available at <u>www.floodinfo.ie</u> also indicate that the proposed development site is not at risk of fluvial or tidal flooding in the 1% AEP, (0.5% AEP tidal) and 0.1% AEP flood events. The proposed development site is considered to be located within Flood Zone C with regard to fluvial and tidal flooding.

3.10.2 OPW BENEFITTING LANDS

The site is not located within areas delineated as Benefitting Lands. Benefitting Lands are titled as such as they are deemed to have benefitted by local drainage schemes aiding the agricultural potential of the lands. Benefitting Lands often had recurring flood issues. Dublin City Centre which includes the proposed development site is not indicated to be located on lands which have benefitted from drainage works under the Arterial Drainage Scheme, Drainage Districts, or Land Commission schemes conducted over the years. The Benefitting Lands mapping data is available at www.floodinfo.ie.

3.11 Topographical Survey and Site Walkover

3.6.1 Site Topographical Survey Data

A topographical survey was carried out across the proposed development site location which can be seen in Appendix A of this report.

The highest site layout level was recorded in the north corner of the proposed development site. The proposed site levels slope down from the north corner to every other corner of the site. The lowest site levels recorded on site are at the southeast corner. The outfalls of the surface water drainage network will be located at the east and west corners of the proposed development site, both of which are lower than the north corner of the proposed site.

Relevant topographical levels to the subject site are listed in Table 2 below.

Location	Lowest Site Level	Highest Site Level	West Outfall Proposed Cover Level	East Outfall Proposed Cover Level	
Level (mAOD)	39.27	43.250	39.84	39.96	
Table 2 - Relevant Survey Levels					

3.12 Findings of Level 2 Assessment

3.12.1 Summary of Collected Information and Mapping

- The Dublin County Council and OPW flood risk and management mapping indicate that the subject site is entirely in Flood Zone C with respect to fluvial and coastal flooding.
- OPW and DCC flood records do not identify any historical flooding at or near the proposed development site.
- The development site is not located on Benefitting Lands.
- The proposed development site is indicated to be partially in an area at risk of pluvial flooding.
- The proposed development will have a semi-basement providing car parking spaces. Surface water and/or groundwater flooding must be considered.

• The proposed development site is located in Flood Zone C and the Justification Test will not apply.

This site-specific flood risk assessment report follows the sequential assessment approach identified in the Strategic Flood Risk Assessment for Dublin City Development Plan 2022 – 2028. The Scales and Stages of Flood Risk Assessment are broken down into different tiers, the relevant tiers to this SSFRA are:

- Strategic Flood Risk Assessment (SFRA) The SFRA provides a broad basis (masterplan, areawide or city/ countywide) assessment of all types of known flood risk to inform strategic land use planning decisions. The SFRA allows the Planning Authority to undertake the sequential approach (described below) and identify how flood risk can be reduced as part of the Development Plan process. Where development is planned in flood risk areas, a detailed flood risk assessment may have to be carried out within the SFRA so that the potential for development of the lands and their flood risk and wider environmental impact can be assessed. The SFRA will provide more detailed information on the spatial distribution of flood risk to enable adoption of the sequential approach and to identify where it will be necessary to apply the Justification Test. The Flood Risk Assessment undertaken for the Dublin City Development Plan is at the Strategic Flood Risk Assessment scale.
- Site Specific Flood Risk Assessment (SSFRA) A site-specific FRA is undertaken to assess all types of flood risk for a new development. This requires identification of the sources of flood risk, the effects of climate change on the flood risk, the impact of the proposed development, the effectiveness of flood mitigation and management measures and the residual risks that then remain.

4 PROPOSED DEVELOPMENT FLOOD IMPACT

4.1 Climate Change

Consideration must be provided for the effects of climate change and how it will affect flooding at the proposed development site. The Strategic Flood Risk Assessment for Dublin City Development Plan 2022 – 2028 states: The OPW guidance recommended two climate change scenarios are considered. These are the Mid-Range Future Scenario (MRFS) and the High-End Future Scenario (HEFS). The allowances should be applied to the 1% AEP fluvial or 0.5% AEP tidal levels. Where a development is critical or extremely vulnerable (see Figure 10) the impact of climate change on 0.1% AEP flows should also be applied, and greater climate change allowances tested for resilience purposes.

Development vulnerability	Fluvial climate change allowance (increase in flows)	Tidal climate change allowance (increase in sea level)	Storm water / surface water
Less vulnerable	20%	0.5m (MRFS)	20% increase in rainfall
Highly vulnerable	20%	0.5m (MRFS)	
Critical or extremely vulnerable (e.g. hospitals, major sub-stations, blue light services)	30%	1.0m (HEFS)	30% increase in rainfall

Figure 10 - Climate Change Allowances by Vulnerability and Flood .	Source
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This development is classified as Highly Vulnerable development, and flood risk was assessed to the MRFS for climate change. This allowed 20% increase in extreme rainfall depths, 20% increase in flows, and 0.5m increase in sea level.

In the current climate scenario, this proposed development site is located in Flood Zone C. The development site has an average ground level of ca. 42.00mAOD. Accounting for a 0.5m rise in sea level during the MRFS will not increase coastal flood risk to this development site. There are no current records of streams or watercourses local to the proposed development site. Allowing for a 20% increase in flood flows of rivers during the MRFS will not increase flood risk to the proposed development site due to the significant distance and drop in elevation to the nearest watercourse, the Tolka River.

The MRFS for climate change for River Flood Extents and Coastal Flood Extents maps available at <u>www.floodinfo.ie</u> were consulted and studied. The CFRAM flood data available indicates that the proposed development is not at risk of fluvial or tidal flooding during the MRFS for climate change.

To account for the effects of climate change during the MRFS for pluvial flooding, the surface water design engineer report, *JOR Hartfield Place Engineering Site Services Report for Proposed Housing Development Application at Swords Road, Whitehall, Doc. No. HARTPL-JOR-SM-ZZ-RP-C-9050_A,* included a 20% allowance for additional increase in rainfall intensities. This ensures that the stormwater runoff during 100-year storm event including an allowance for 20% increase in rainfall intensities can be retained within the site boundaries and permitted to outfall from the site boundary at a controlled outfall flow rate.

4.1.1 Other Flooding

The proposed development includes semi-basement which provides car parking spaces for the development site. The semi-basement exposes the proposed development site to a potential source of flooding. The proposed semi-basement must be constructed as a watertight structure to ensure that no flooding occurs due to groundwater ingress into the car park. The proposed entrance ramp to the carpark must incorporate a raised table to ensure runoff water cannot divert to the underground basement level. A drainage collection channel to collect surface water near to the ramp must also be included. The semi-basement car parking area includes a provision for a drainage network designed to drain any surface water that may accumulate within the basement. The JOR *Hartfield Place Engineering Site Services Report for Proposed Housing Development Application at Swords Road, Whitehall, Doc. No. HARTPL-JOR-SM-ZZ-RP-C-9050_A states with respect to the semi-basement drainage:*

"Any surface water from the basement carpark would drain through an underground system of collector pipes towards the lower basement southern wall. A system of gullies and ACO drains will collect water and connect into a 150mm diameter surface water pipe system which will drain through a bypass interceptor prior to discharge into a pump chamber. From the pump chamber, basement water will be pumped via a 60mm ductile iron rising main which will connect into the gravity foul drainage system for the site at ground floor level."

The proposed smaller semi-basement results in a reduced flood risk compared to the full, deeper basement previously permitted under the SHD 313289-22. The proposed semi-basement provides outfall points for the surface water so that it is less likely to accumulate and cause flooding in comparison to the full semi-basement.

The proposed surface water design incorporates Green Roofs as a SUDS measure. The green roofs must be designed in such a way that no surface water from the green roof area infiltrates down into the buildings so that it may cause flooding in the apartments. The structural loading of the roof must incorporate allowance for weight of the grass roof & any stored water.

4.2 Site Drainage

Foul Water

A foul water drainage solution has been designed by JOR Consulting, Civil & Structural Design Engineers. The foul water drainage design is proposed to connect to the existing mains foul water drainage main located in High Park. The foul drainage network is separate from the surface water drainage network and is not expected to be at risk of flooding from pluvial flooding or surcharging of the surface water drainage network. Please see JOR Engineering Services Report Doc. No. HARTPL-JOR-SM-ZZ-RP-C-9050_A issued as a separate document.

<u>Stormwater</u>

The proposed development is located on a greenfield site with no prior existing structures. This site is located in Flood Zone C. The proposed development will comprise of a dedicated surface water drainage system and a foul water drainage system each discharging to the existing public surface water and foul water drainage networks.

The approved surface water network under the SHD 313289-22 consisted of two separate networks with two different outfalls. Each network consisted of storm drainage, slung drainage from basement roof slab, basement drainage system, SUDS features, an attenuation system, downstream defender and a Hydrobrake. The SUDS features were made up of bioretention areas, green roofs, permeable paving & filter drains. The total attenuation storage provided was 1690m³. The total discharge rate for the site was 5.6l/s which equates to 2l/s/ha. The discharge for the outfall onto the Swords Road was restricted to 1.6 l/s as from the GDSDS 2031 System Performance Assessment Report, the 300mm DIA public surface water main was found to be under the risk of surcharging. The discharge for the outfall into High Park was restricted to 4.0 l/s.

The proposed surface water system will remain largely the same as the previously approved system. The SHD permitted stormwater outfalls and SHD permitted attenuation volume will remain unchanged (note impermeable areas are less than the permitted SHD due to the reduction in the size of the basement area. The surface water network will connect to a new manhole which will be installed on the existing 300mm DIA storm main in the Swords Road. The surface water outfall to Swords Road will have a discharge rate of 1.6l/s which is the same as the existing planning. The outfall discharging to the existing surface water main in High Park will connect to an existing manhole and will have a discharge rate of 4.0l/sec. A non-return valve is included on the two stormwater drainage outlets to ensure no surcharging of the internal storm sewer from the public road drainage.

To account for the effects of climate change in the MRFS, the surface water design engineers have included an allowance for a 20% increase in rainfall intensities. This ensures that the 100-year storm event including the 20% climate change allowance can be retained within the site boundaries and permitted to discharge from the site at a controlled outfall flow rate.

The entrance to the car park incorporates an ACO Channel to prevent surface water entering the semibasement car park, instead re-directing it to the stormwater drainage network. The semi-basement car parking area includes a drainage network designed to drain any surface water that may enter from other sources. It is proposed to install a raised table at car park entrance to act as a physical barrier preventing surface water runoff from flowing down the car park ramp. Refer to JOR Consulting Civil & Structural Engineers, Engineering Services Report issued as a separate document.

4.3 Access & Egress

The proposed development site is indicated to be located in Flood Zone C and can remain accessible to emergency vehicles at all times including the MRFS for climate change event.

4.4 FFL

The proposed development site is located entirely within Flood Zone C with regard to fluvial and tidal flooding. Each of the proposed apartment blocks and the proposed creche will have individual FFLs. Flood risk to the proposed site is deemed to be primarily from pluvial flooding which the proposed stormwater network has been modelled and designed to ensure that there is no residual risk of flooding to the individual building units, in the 1 in 100-year rainfall event including an allowance for climate change and blockages of the stormwater system. The FFL of the proposed apartment blocks and are listed below:

- Block A 43.150mAOD
- Block B 42.650mAOD
- Block C 41.150mAOD
- Block D 43.030mAOD
- Block E 43.030mAOD
- Block F 40.40mAOD
- Block G 40.30mAOD

4.5 Displacement of Flood Waters

The proposed development site is located within Flood Zone C with regard to fluvial and tidal flooding. Parts of the proposed development site are indicated to be partially at risk of Pluvial Flooding. The proposed stormwater drainage network is designed to provide storage for 100-year pluvial storm event including an allowance of 20% for climate change. The pluvial rainfall incident on this proposed development site will be stored within attenuation tanks and allowed to outfall to the public storm water network at a controlled outfall flow rate to ensure there is no displacement of flood waters or exacerbation of flooding. There are no proposed buildings or structures located within the indicated pluvial flood extents shown above in Figure 8.

4.6 Residual Risk

The proposed development site is not located within a defended area, as such there is no residual risk to this development from a possible failure of flood defences. Residual risks for this proposal remain from possible partial blockage of the surface water drainage network or from a surcharge of the public storm drainage network. The surface water drainage solution for this proposed development is similar in design to the previous planning applications for the site, which were granted planning permission.

The surface water drainage system for this proposed development has been designed in accordance with GDSDS and the DCC Strategic Flood Risk Assessment, ensuring that the 1 in 100-year pluvial event including an allowance of 20% for climate change can be retained on site. The proposal has been designed so that there is no increase in stormwater risk elsewhere by limiting and restricting the outfall flow rates from the site to 1.6l/s to Swords Road, and 4l/s to the High Park surface water sewers for a combined total outfall flow rate of 5.6l/s. The discharge rate of 5.6l/s has been agreed with DCC for the extant planning. Please see copy of correspondence attached herewith.

This proposed site actually has a greenfield runoff rate Q_{BAR} of 18.35l/s and a Q_{100} flow rate of 47.89l/s and the controlled outfall flow rate from the site is much lower than both of these values, reducing the risk of exacerbating flooding elsewhere.

In this site's pre-development condition, the groundwater surface runoff of the proposed site flows primarily in a southeast direction. The surface water drainage proposal will collect the surface water via a number of SUDS features including green roofs, raingardens/podium green roofs, roof bioretention areas, infiltration trenches, tree pits, permeable paving and gullies. The SUDS features will divert stormwater to the attenuation tanks before discharging via proposed Hydrobrake flow control devices to Swords Road and High Park surface water sewers. In an exceedance event, or should there be attenuation tank blockages, overland flow routes from the proposed development will remain as per the predevelopment flow routes and the surface water will flow primarily towards the southeast corner.

This is primarily towards the Beech Lawn Estate and Highfield Health Care Centre. The receptor in the exceedance flood event may be the Health Care Centre which is classified as Highly Vulnerable Development per *The Planning System and Flood Risk Management, Guidelines for Planning Authorities, OPW 2009.* The Strategic Flood Risk Assessment for Dublin City Development Plan 2022 – 2028 classifies the Hospitals and Blue Light Services as Critical or Extremely Vulnerable Development per the table shown in Figure 10 above. Therefore, it was prudent to consider mitigation measures for the exceedance event.

It is proposed to install a high-level overflow gully with raised kerbing at the southeast corner of the site. The raised kerbing will act as a physical barrier, preventing the surface water in the exceedance event from flowing towards the Health Care Centre. The high-level overflow gullies will be set at 40.00mAOD and will overflow to manhole S2-37 which discharges to the High Park surface water sewer. The high-level gullies will only function in the exceedance event or if the attenuation tanks become blocked causing water to accumulate in the southeast corner of the site. In normal rainfall events these high-level overflow gullies will not be discharging to the High Park surface water mains.

The expected overland flow routes have been marked on the site layout drawing which is visible below in Figure 11.

We note the SFRA for the Dublin City Development Plan 2022-2028 states "It is essential that overland flow routes are retained, and development does not obstruct or divert them without full appraisal of the consequences for other sites and developments and that identified risks are fully mitigated."

The overflow gulley arrangement is not strictly necessary as overland flows were always to the SE in the pre-development condition and the proposed stormwater system satisfies the GDSDS criterion to retain the 100-year flood volume on site. DCC have also permitted similar drainage proposals in under

the SHD 313289-22. Regardless of these facts, due to the specific vulnerability of the healthcare facility to the southeast, it is deemed a sensible measure to arrange an overflow pipeline, to limit residual flood risks and perhaps improve flood protection to the local area.



Figure 11 - Overland Flow Paths

4.6.1 Mitigation Measures

The proposed development site is considered to be located in Flood Zone C with regard to fluvial and tidal flooding. The following mitigation measures are proposed to protect the development from surface water drainage threats. The proposed mitigation measures are unchanged from the development previously approved under the SHD 313289-22.

- FFLs are predicted to be protected from flooding with suitable freeboard to attenuation tank TWL. It is necessary to remodel storm systems should any changes to ground levels or surface water drainage take place post-planning.
- Storm and Foul Drainage to be as per JOR Engineering Services Report.
- Basement level to be a watertight structure to prevent groundwater ingress. Failure of this may lead to flooding of the basement area. Flotation/Buoyancy to be accounted for in the structural design.
- Basement car ramp to be protected by a raised table/ramp at the upper level, to physically ensure surface water runoff into the basement cannot occur.

- The proposed underground pumping station must be supplied with duty standby pump arrangement, with a backup power supply by way of generator. It is recommended to ensure the electrical control panel is located at least 1m above finished ground level of the basement.
- Roof structure to ensure allowance for weight of grass roof and any water accumulation which may occur.
- Hydrobrake or other control devices to be sized taking into account the receiving manhole peak flood water level to ensure adequate outflow at all times.
- Non-return valves to be installed at the outfall of the surface water network to the public storm drains. This will ensure that in the event that the Swords Road public storm drain network becomes surcharged that it will not surcharge the proposed on-site attenuation tanks.
- Install an overflow storm gulley with suitable kerb height, to be located in SE corner of development, diverting to the High Park manhole S2-37 in the NE corner of the site. Cover Level of gulley to be set 300mm below Block G FFL.

Refer to the site location layout drawing in Appendix A of this report.

5 REPORT CONCLUSION

5.1 Conclusion

The proposed development is for a LRD Application for amendments to permitted development ABP 313289-22 for Apartments, Creche, Cafe and Associated Works at a site at 'Hartfield Place', Swords Road, Whitehall, Co. Dublin. The proposed amendments include the replacement of the permitted basement with a semi-basement under blocks D, E, and part of the communal open space. The amendments will result in an increase in height of blocks D, E, and B, alteration to and reduction of the number of car parking spaces on site, alteration to the cycle parking locations, and changes to the open space layout. Amendments to the internal layout of Blocks A, B, C, D, & E resulting in the increase in the total number of units by 29 units, with an overall total of 334 units.

The proposed development is located within an area identified as Flood Zone C regarding fluvial and coastal flooding. This is categorized as a highly vulnerable development however it is in Flood Zone C and is not subject to a Justification Test per *The Planning System and Flood Risk Management, Guidelines for Planning Authorities, OPW 2009.*

The proposed development site has been identified to be located adjacent to and slightly within an area identified by DCC as at risk of pluvial flooding. It is considered the surface water drainage proposal to be in accord with GDSDS requirements. Outfall flowrates are proposed to be controlled to predetermined rates agreed with DCC drainage department. The stormwater system caters for the 1 in 100-year flood flows plus 20% additional rainfall depth for the MRFS for climate change. Similar drainage proposals were accepted under the SHD 313288-22.

Exceedance flow routes are in a south easterly direction, as per natural pre-development ground conditions, i.e. to the lowest corner of the proposed site. This is primarily towards the Beech Lawn Estate and Highfield Health Care Centre. The mitigation measures detailed above are recommended to be implemented to limit runoff levels in exceedance events towards the SE neighbouring developments. This measure is in excess of the normal GDSDS requirements however it is considered appropriate and in compliance with SFRA for the Dublin City Development Plan 2022-2028.

Based on the above assessments and owing to its location within Flood Zone C, outside the Fluvial and Coastal Flood Zones, there is an overall low risk of flooding to the site.

This Site-Specific FRA deems the proposed development to be appropriate and to comply with SFRA for the Dublin City Development Plan 2022-2028 and the "Planning System and Flood Risk Management – Guidelines for Planning Authorities" (DoEHLG/OPW, 2009).

6 REFERENCES

- Office of Public Works.
- Preliminary Flood Risk Assessment (PFRA) Study Maps (<u>http://www.cfram.ie/pfra/interactive-mapping/</u>).
- Catchment and Flood Risk Management Program (OPW Website http://www.cfram.ie).
- OPW online viewer https://maps.opw.ie/fhrm/viewer/
- OPW viewer www.floodinfo.ie
- The Planning System and Flood Risk Management Guidelines for Planning Authorities, 2009
- EPA Envision Mapping (gis.epa.ie/envision)
- Google Maps
- Ordnance Survey of Ireland
- www.floodmaps.ie
- Jacob's Ltd Flood Modeller Software Package
- HR Wallingford: Defra & Environment Agency R&D Outputs: Flood Risks to People Phase 2, FD2321/TR2 Guidance Document, 2006.
- Dublin City Development Plan 2016-2022, Strategic Flood Risk Assessment (SFRA)
- Dublin City Development Plan 2022-2028, Strategic Flood Risk Assessment (SFRA)

APPENDIX A

Refer Overleaf for

- Current Site Layout Drawing
- Scaled Site Survey Drawing
- Dublin County Council Flood Maps
- Local Area Summary Report
- PFRA Integrated Map_238



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P04	19/07/2024	Site plan GF updated	CWO
P03	18/07/2024	Car parking updated	CWO
P02	03/07/2024	Site boundary updated	CWO
P01	25/06/2024	Draft Final LRD Application	CWO
Rev	Date	Description	Issued By

Project Stage

Planning

Client: EW Property Limited

Project: Hartfield Place Swords Road, Whitehall, Dublin 9 D9 C7F8 Drawing Title: SITE PLAN - GROUND FLOOR Drawn Checked Paper Size Scale @A1 25/06/2024 As AM AB A1 indicated Project No. Drawing No. Classification Revision 0004 PE18138 P04 File Name PE18138-CWO-ZZ-00-DR-A-0004 Purpose Code Issued for Information Acceptance Code S - Issued C+W O'BRIEN

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Flood Depth Map Model 2 Envil Dublin City Model boundaries Legend Flood Depth (in m) 0 m to 0.1 m 0.1 m to 0.2 m 0.2 m to 0.3 m 0.3 m to 0.5 m 0.5 m to 1.0 m 1.0 m to 2.0 m > 2.0 m Model Boundary Notes **JACOBS** Client formation in Chapterine XY Dublin City Bule Atta Cliatt Project FloodResilienCity Project Type 1 Model - Flood Depth Map Dublin - 1% AEP Event - 3hr Duration Title Drawing Status DRAFT Job No. 32102500 Figure No. Revision 32102500/D/OV/FD/0010 0 Date : Scale

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Drawn MM Checker MV Review PS Approved CF





Report Produced: 14/8/2024 12:24

This Past Flood Event Summary Report summarises all past flood events within 2.5 kilometres of the map centre.

This report has been downloaded from www.floodinfo.ie (the "Website"). The users should take account of the restrictions and limitations relating to the content and use of the Website that are explained in the Terms and Conditions. It is a condition of use of the Website that you agree to be bound by the disclaimer and other terms and conditions set out on the Website and to the privacy policy on the Website.



27 Results

		Name (Flood_ID)	Start Date	Event Location
1.	\land	Donnycarney Dublin Recurring (ID-10680)	n/a	Approximate Point
	Addi	tional Information: <u>Reports (4)</u> <u>Press Archive (0)</u>		
2.	Δ	Tolka November 1901 (ID-25)	12/11/1901	Approximate Point
	Addi	tional Information: <u>Reports (9)</u> <u>Press Archive (0)</u>		
3	Δ	Tolka September 1931 (ID-26)	02/09/1931	Approximate Point
	Addi	tional Information: <u>Reports (12)</u> Press Archive (1)		
4	Δ	Tolka Nov 1965 (ID-23)	25/11/1965	Approximate Point
	Addi	tional Information: <u>Reports (9)</u> <u>Press Archive (2)</u>		
5	Δ	Report of flooding at Jones Road, Dublin 3 on 26th July 2013 (ID-11945)	25/07/2013	Approximate Point
	Addi	tional Information: <u>Reports (1)</u> Press Archive (0)		
6	Δ	Tolka November 1915 (ID-30)	12/11/1915	Approximate Point
	Addi	tional Information: <u>Reports (11)</u> <u>Press Archive (0)</u>		

	Name (Flood_ID)	Start Date	Event Location
7.	Tolka April 1909 (ID-31)	03/04/1909	Approximate Point
	Additional Information: <u>Reports (5)</u> <u>Press Archive (0)</u>		
8.	Tolka Richmond Road August 1986 (ID-3346)	24/08/1986	Approximate Point
	Additional Information: <u>Reports (4)</u> <u>Press Archive (0)</u>		
9.	Tolka Botanic Ave area August 1986 (ID-24)	24/08/1986	Approximate Point
	Additional Information: <u>Reports (11)</u> <u>Press Archive (1)</u>		
10	Tolka November 1898 (ID-29)	23/11/1898	Approximate Point
	Additional Information: <u>Reports (10)</u> <u>Press Archive (0)</u>		
11.	Tolka October 1880 (ID-21)	28/10/1880	Approximate Point
	Additional Information: <u>Reports (8)</u> <u>Press Archive (0)</u>		
12.	Tolka River 24th Oct 2011 Botanic Gardens (ID-11488)	23/10/2011	Approximate Point
	Additional Information: <u>Reports (1)</u> <u>Press Archive (0)</u>		
13.	North Strand Road June 1963 (ID-291)	10/06/1963	Exact Point
	Additional Information: <u>Reports (4)</u> <u>Press Archive (2)</u>		
14.	Donnycarney Wad June 1963 (ID-292)	10/06/1963	Exact Point
	Additional Information: <u>Reports (4)</u> <u>Press Archive (2)</u>		
15.	Wad River Ballymun Dec 1954 (ID-666)	08/12/1954	Exact Point
	Additional Information: <u>Reports (1)</u> <u>Press Archive (0)</u>		
16.	Mad River Santry Jan 1965 (ID-667)	20/01/1965	Approximate Point
	Additional Information: <u>Reports (1)</u> <u>Press Archive (0)</u>		
17.	Tolka September 1946 (ID-28)	19/09/1946	Approximate Point
	Additional Information: <u>Reports (11)</u> <u>Press Archive (0)</u>		
18.	Tolka Glasnevin August 1986 (ID-3345)	24/08/1986	Approximate Point
	Additional Information: <u>Reports (2)</u> <u>Press Archive (0)</u>		
19.	Tolka November 2002 (ID-5)	13/11/2002	Area
	Additional Information: <u>Reports (143)</u> Press Archive (13)		
20	. Dublin City Tidal Feb 2002 (ID-456)	01/02/2002	Area
	Additional Information: <u>Reports (45)</u> <u>Press Archive (27)</u>		
21.	A Dublin Area 020709 (ID-10660)	02/07/2009	Approximate Point
	Additional Information: <u>Reports (1)</u> <u>Press Archive (0)</u>		
22	Tolka December 1954 (ID-4)	08/12/1954	Area
	Additional Information: <u>Reports (16)</u> Press Archive (9)		
23	(ID-11566)	23/10/2011	Approximate Point
	Additional Information: <u>Reports (1)</u> <u>Press Archive (0)</u>		
24	. <u> </u>	05/11/2000	Approximate Point
	Additional Information: <u>Reports (6)</u> <u>Press Archive (5)</u>		
25	. 🥂 Tolka Jan 2005 (ID-357)	07/01/2005	Approximate Point
	Additional Information: <u>Reports (1)</u> <u>Press Archive (0)</u>		
26	. 🥂 Tolka Nov 1968 (ID-27)	24/11/1968	Approximate Point
	Additional Information: <u>Reports (5)</u> <u>Press Archive (1)</u>		
27.	A Flooding at Dublin City on 25/07/2013 (ID-12944)	25/07/2013	Approximate Point
	Additional Information: <u>Reports (O)</u> <u>Press Archive (O)</u>		