

HCE Job Ref: 21-679

31/03/2022

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

Applicant: Eastwise Construction Swords 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 will consist of the construction of 7 no. blocks in heights up to 8 storeys (over single level basement) comprising 472 no. apartment units, a creche, café unit, and internal residential amenity space. The proposal also includes car, cycle, and motorcycle parking, public and communal open spaces, landscaping, bin stores, plant areas, substations, switch rooms, and all associated site development works and services provision. Access is provided from the development from Swords Road with associated upgrades to the existing public road and footpaths.

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: 31/03/2022

Prepared By:



HARTPL-JOR-SM-ZZ-RP-C-9003

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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.

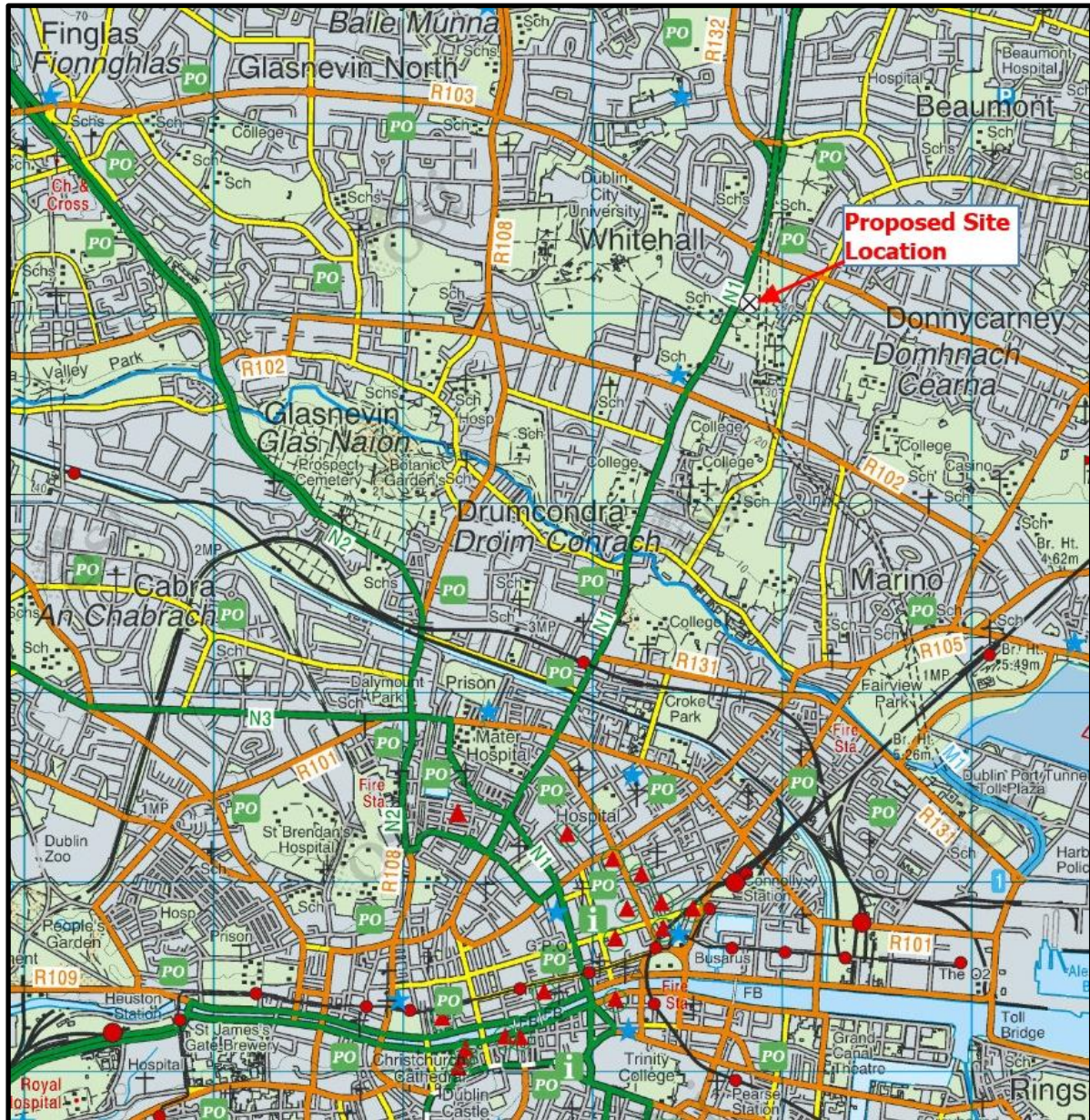


Figure 1 – Site Location. OSI Discovery Map

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

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

2 LEVEL 1 – FLOOD RISK IDENTIFICATION

2.1 Dublin County Council Flood Map

The Strategic Flood Risk Assessment for Dublin City Development Plan 2016 – 2022 Appendix 5 contains the Composite Flood Zone Map. Per the Dublin City Development Plan 2016 – 2022, “the quality of outline 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.

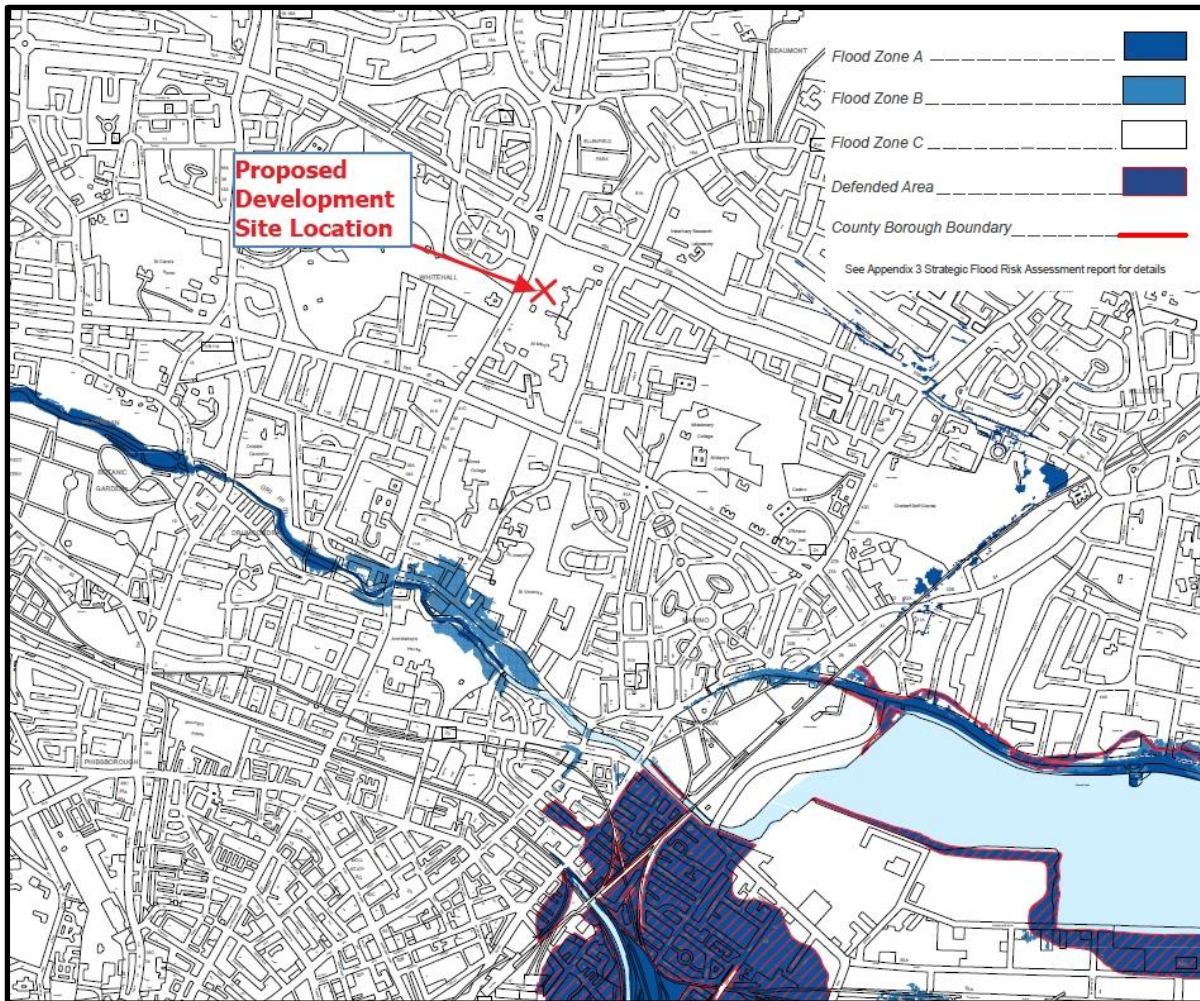


Figure 3 – Dublin City Council Composite Flood Map

3 LEVEL 2 – INITIAL FLOOD RISK ASSESSMENT

3.1 Potential Sources of Flooding

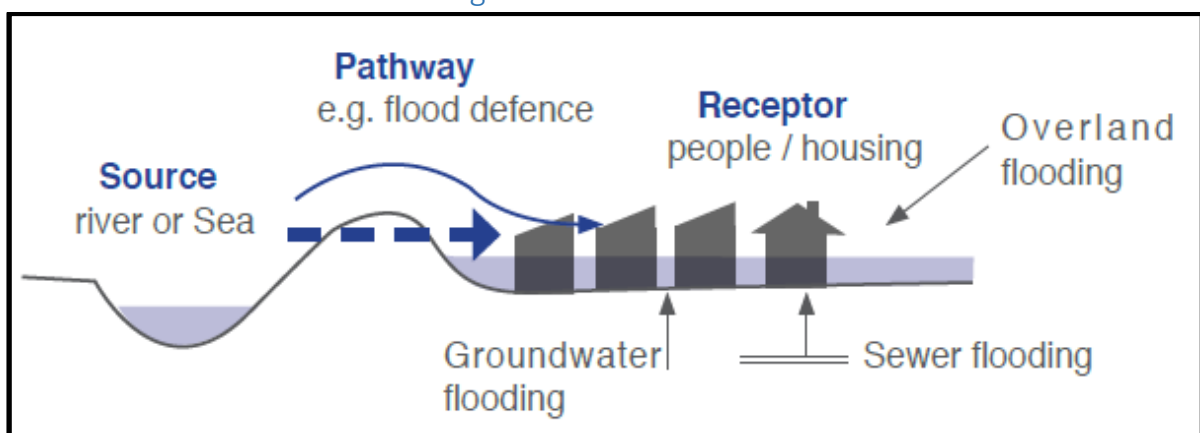


Figure 4 – Example of Source Pathway Receptor Model. Source: Flood Risk Management Guidelines

3.1.1 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.

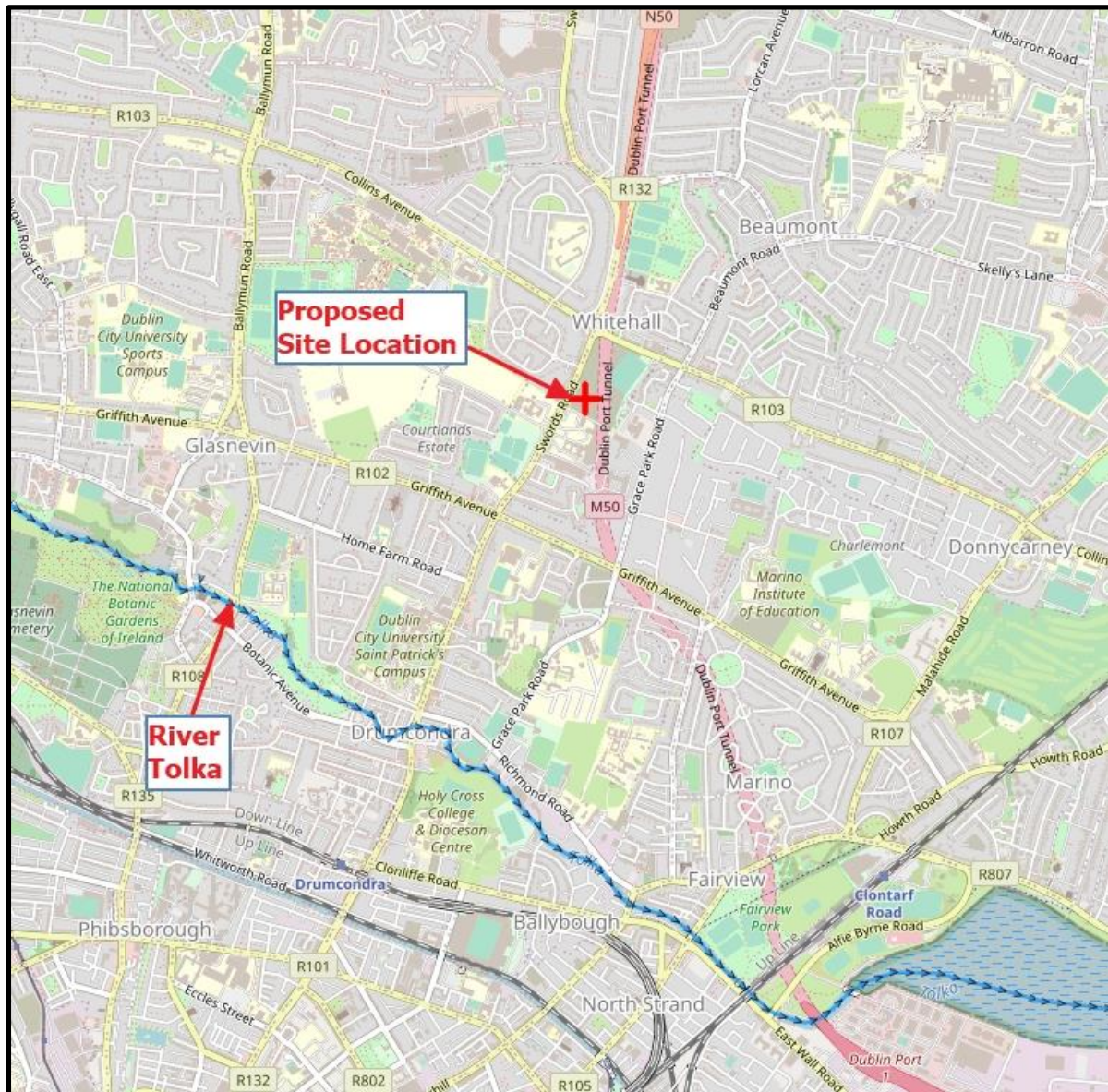


Figure 5 - Site Location & River Catchment. EPA ENVISION MAP

3.1.1.1 Historic Fluvial Sources Mapping

The OSI Historic Map 25 inch (1888 – 1913) indicates that historically a watercourse flowed north of the proposed development site in 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 6 below.

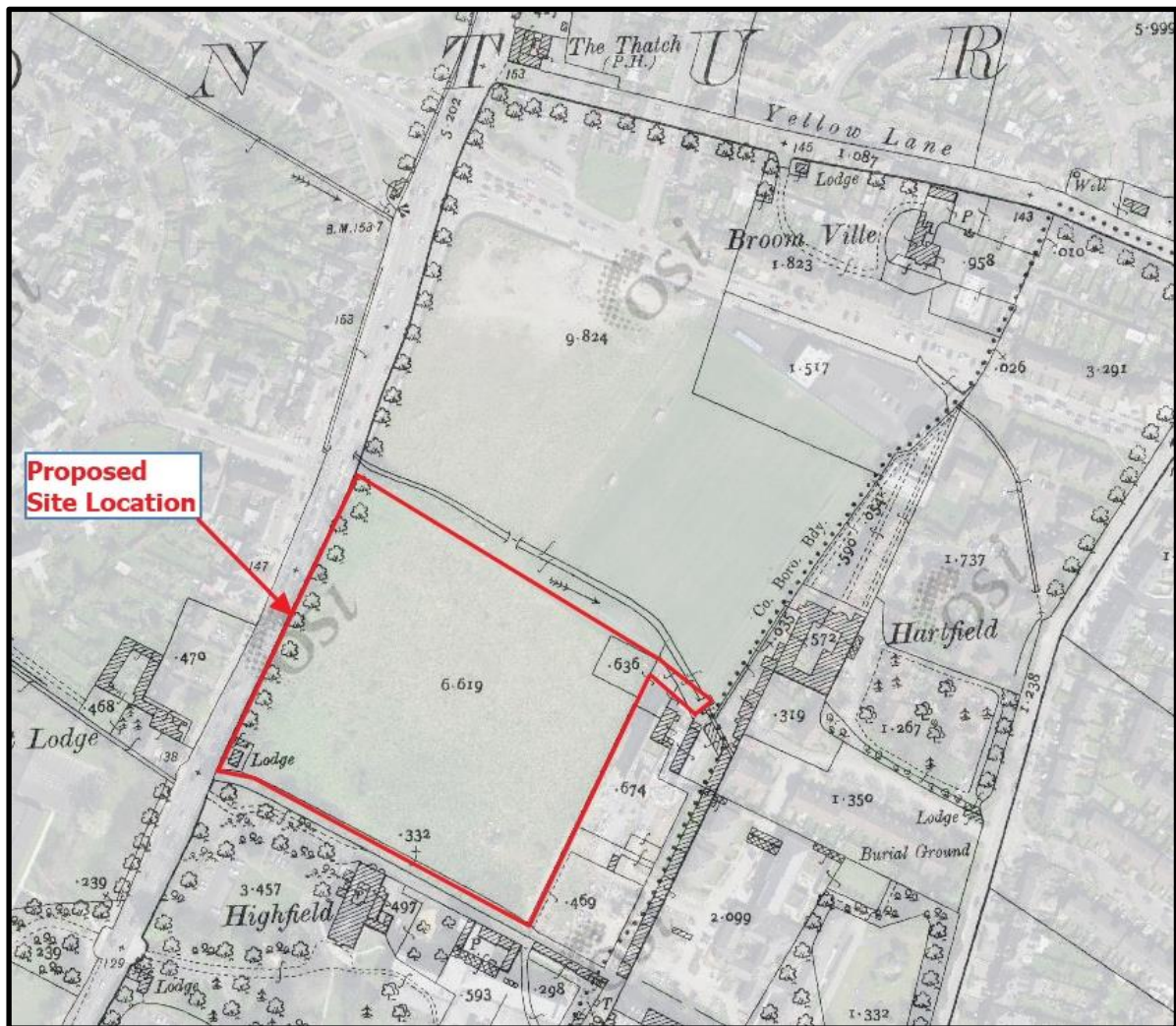


Figure 6 - OSI Historic Map 25 inch (1888-1913)

3.1.2 Pluvial Sources

The Strategic Flood Risk Assessment for Dublin City Development Plan 2016 – 2022 Appendix 6 contains the Dublin City Type 1 Pluvial Flood Depth Map. “Information on pluvial flood risk comes from the EU Interreg IVB Flood Resilience City Project. For the project, a City-wide Model provided a high level assessment of pluvial flood risk across Dublin and five ‘Pilot Areas’ were identified for further detailed investigation of potential pluvial flood risk i.e. Type 2 modelling.

The Type 1 Pluvial Flood Depth Map indicates that parts of the proposed development site are susceptible to pluvial flooding of varying depths between 0.1m to 1m. A stormwater drainage design has been proposed for the development site which will cater for the surface water generated on-site and which will be analysed further on in this report. Please see the pluvial flood mapping in figure 7 below.

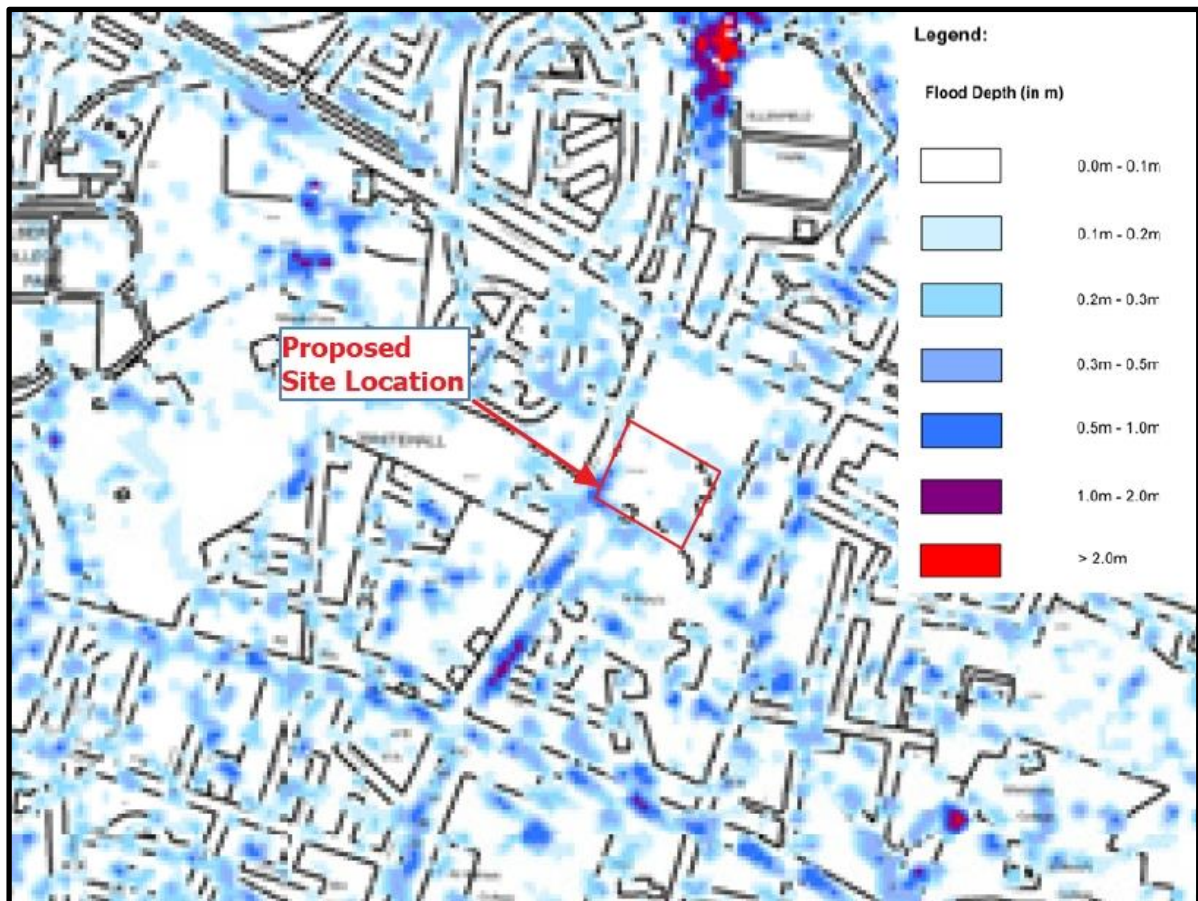


Figure 7 - Dublin City Type 1 Pluvial Flood Depth Map

3.1.3 Coastal Source

The subject site is located ca. 5km from the eastern coast of Ireland with an average GL datum of ca. 42.00mAOD and will not be considered at risk of coastal flooding. The Dublin City Council Composite Flood Map in figure 3 does not indicate the proposed development site to be at risk tidal or fluvial flooding. The proposed development site is considered to be located in Flood Zone C with regard to tidal flooding.

3.1.4 Artificial Drainage Systems

The proposed development will comprise of a dedicated surface water drainage system and a foul water drainage system each outfalling to the existing public surface water and foul water drainage networks.

The approved surface water network for DCC Reg. Ref 3269/10 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, stormbloc 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 GSDSDS 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 currently approved surface water system is the same to the previously approved system (DCC Reg. Ref.3269/10) in that it will consist of two separate networks with two different outfalls, containing surface water drainage, slung drainage, basement drainage, SUDS features and an underground attenuation system. The main difference is that the attenuation tanks will be concrete tanks and not stormbloc cells. 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 extant planning. The outfall discharging into the existing surface water main in High Park will connect into an existing manhole and will have a discharge rate of 4.0l/sec. The greenfield run-off rate for the site, in accordance with the requirements of the GSDS, is 18.35l/s and is considered too high to use.

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-9001.

3.2 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

3.3 Previous Flood History

3.3.1 Historical Records

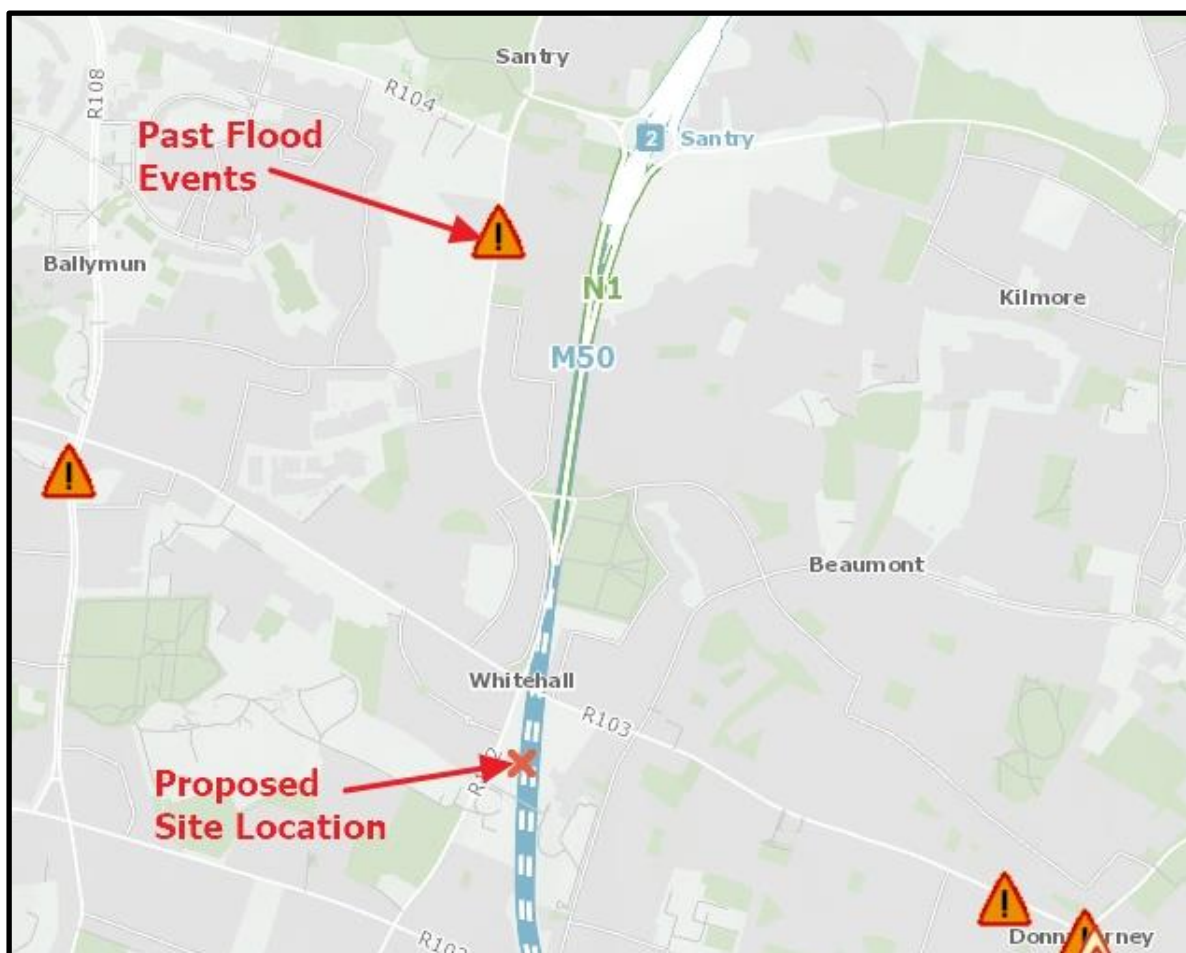


Figure 8 - OPW Flood Hazard Mapping

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 has been appended with this report.

3.4 Flood Hazard & Risk Mapping

3.4.1 Dublin County Council – Flood Map

Per the map shown in figure 3 above, the proposed site is indicated to be located entirely outside the 1% AEP and 0.1% AEP Fluvial and Tidal Flood Extents according to the DCC Composite Flood Map.

Consulting the 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 2016 – 2022, the PFRA “maps provide only an indication of areas that may be prone to flooding. They are not necessarily locally accurate and should not be used as the sole basis for defining Flood Zones, or for making decisions on planning applications”. “The OPW’s Preliminary Flood Risk Assessment (PFRA) mapping provides indicative flood extents for fluvial,

coastal, groundwater and storm (surface) water risks; however, the PFRA was not used in developing the flood zone map for the City SFRA as there were more detailed studies" available in Dublin City. PFRA Integrated Map_238 has been appended in Appendix A of this report.

The CFRAM fluvial and tidal flood extents available at www.floodinfo.ie also indicates that the proposed development site to not be at risk of fluvial and tidal flooding in the 1% AEP 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.

This site-specific flood risk assessment report follows the sequential assessment approach identified in the *Strategic Flood Risk Assessment for Dublin City Development Plan 2016 – 2022*. 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 (area-wide or county wide) 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 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.

3.4.2 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. This proposed development site and all of Dublin City Center are indicated to not be located within Benefitting Lands per the available map data found at www.floodinfo.ie.

3.5 Topographical Survey and Site Walkover

3.6.1 Site Topographical Survey Data

A topographical survey was carried out across the proposed development site location. The topographical data has been added to the site layout drawing and appended 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 south east 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 the table 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

3.6 Findings of Level 2 Assessment

3.6.1 Summary of Collected Information and Mapping

- The Dublin County Council and OPW flood risk and management mapping indicate that the subject site is entirely outside the predicted 1% AEP and 0.1% AEP fluvial and tidal flood extents i.e. the site is predicted to be located in Flood Zone C.
- OPW and DCC flood records do not identify any historical flooding near the proposed development site.
- The Benefitting Lands extents do not encroach upon the proposed development site.
- The proposed development site is indicated to be located in an area at risk of pluvial flooding.
- The proposed development will have an underground car parking area and surface water or groundwater flooding must be considered.

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. Two climate change scenarios can be considered. The Mid-Range Future Scenario (MRFS) and the High-End Future Scenario (HEFS). These are both assessed on the 100-year time horizon. The OPW provides a table with the recommended allowances for climate change for these two scenarios. This table can be seen in figure 9 below.

For this proposed development site fluvial flooding was assessed to the mid-range future scenario (MRFS) for climate change which allowed 20% increase in extreme rainfall depths and / or 20% increase in flows and / or 0.5m increase in sea level as this proposed development site is located in Flood Zone C.

The MRFS for climate change for River Flood Extents and Coastal Flood Extents maps available at www.floodinfo.ie 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 Engineering Services Report for SHD Development at Swords Road, Whitehall, Dublin 9*, included a 20% allowance for additional increase in rainfall intensities. This ensures that the 100-year storm event including an allowance for 20% rainfall intensities increase during the MRFS climate change event can be retained within the site boundaries and permitted to outfall from the site boundary at a controlled outfall flow rate.

Parameter	MRFS	HEFS
Extreme Rainfall Depths	+ 20%	+ 30%
Peak Flood Flows	+ 20%	+ 30%
Mean Sea Level Rise	+ 500 mm	+ 1000 mm
Land Movement	- 0.5 mm / year ¹	- 0.5 mm / year ¹
Urbanisation	No General Allowance – Reviewed on Case-by-Case Basis	No General Allowance – Reviewed on Case-by-Case Basis
Forestation	- 1/6 Tp ²	- 1/3 Tp ² + 10% SPR ³

Figure 9 – Table 2 Allowances in Flood Parameters for Mid-Range and High-End Future Scenario from Floodinginfo.ie

4.1.1 Other Flooding

The proposed development includes an underground car park. The underground car parking exposes the proposed development site to a potential source of flooding. The proposed underground car parking 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 underground car parking area includes a provision for a stormwater drainage network designed to drain any surface water that may accumulate within the basement. This proposed drainage network pumps the water out of the car park and up to a foul sewer collection manhole following pre-treatment in a Class 1 Petrol Interceptor.

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-9001 issued as a separate document.

Stormwater

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

The approved surface water network for DCC Reg. Ref 3269/10 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, stormbloc 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 currently approved surface water system is the same to the previously approved system (DCC Reg. Ref.3269/10) in that it will consist of two separate networks with two different outfalls, containing surface water drainage, slung drainage, basement drainage, SUDS features and an underground attenuation system. The main difference is that the attenuation tanks will be concrete tanks and not stormbloc cells. 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 extant planning. The outfall discharging into the existing surface water main in High Park will connect into an existing manhole and will have a discharge rate of 4.0l/sec. The greenfield run-off rate for the site, in accordance with the requirements of the GDSDS, is 18.35l/s and is considered too high to use.

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

The entrance to the car park incorporates an ACO Channel to prevent surface water from above ground from flowing into the underground car park. The ACO Channel re-directs the surface water to the proposed stormwater drainage network. The underground car parking area includes a provision for a stormwater drainage network designed to drain any surface water that may accumulate underground from any other sources such as wet cars driving in. It is also 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 & 41.650mAOD
- Block C – 41.150mAOD
- Block D – 42.150mAOD
- Block E – 41.150mAOD
- 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.

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 proposed surface water drainage solution for this proposed development is similar in design to previous planning applications for the same site, which were granted planning permission. The planning applications are DCC reg. ref. no. 3269/10 / ABP Ref. PL29N.238685 granted planning permission in 2011 (as extended under DCC reg. ref. 3269/10/X1 and DCC reg. ref. no. 3405/19 which expires in April 2022).

The surface water drainage system for this proposed development has been designed in accordance with GSDS and the DCC Strategic Flood Risk Assessment by ensuring that the 1 in 100-year pluvial storm event including an allowance of 20% for climate change can be retained on site. The proposal has been designed to ensure 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 surface water sewer and 4l/s to the High Park surface water sewer 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 SUDS features, permeable paving & gullies and divert stormwater to the attenuation tanks before outfalling 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. As 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* 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 south east 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 south east 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 10.

We note the SFRA for the Dublin City Development Plan 2016-2022 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 planning ref. no. 3269/10 and 3405/19. Regardless of these facts, due to the specific vulnerability of the healthcare facility to the south-east, 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 10 - 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.

- 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 stormwater 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.
- Hydrobrakes 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 will consist of the construction of 7 no. blocks in heights up to 8 storeys (over single level basement) comprising 472 no. apartment units, a creche, café unit, and internal residential amenity space. The proposal also includes car, cycle, and motorcycle parking, public and communal open spaces, landscaping, bin stores, plant areas, substations, switch rooms, and all associated site development works and services provision. Access is provided from the development from Swords Road with associated upgrades to the existing public road and footpaths. A full description of the development is provided in the statutory notices and in Chapter 3 of the EIAR submitted with the application. The proposed development is located within an area identified as Flood Zone C with regard to fluvial and tidal flooding. This is categorized as a highly vulnerable development however it is located 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 pre-determined 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 mid-range future scenario for climate change. Similar drainage proposals were accepted by DCC in planning ref. no. 3269/10 and 3405/19.

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 2016-2022.

Based on the above assessments and owing to its location within Flood Zone C, outside the Fluvial and Tidal 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 2016-2022 and the “Planning System and Flood Risk Management – Guidelines for Planning Authorities” (DoEHLG/OPW, 2009).

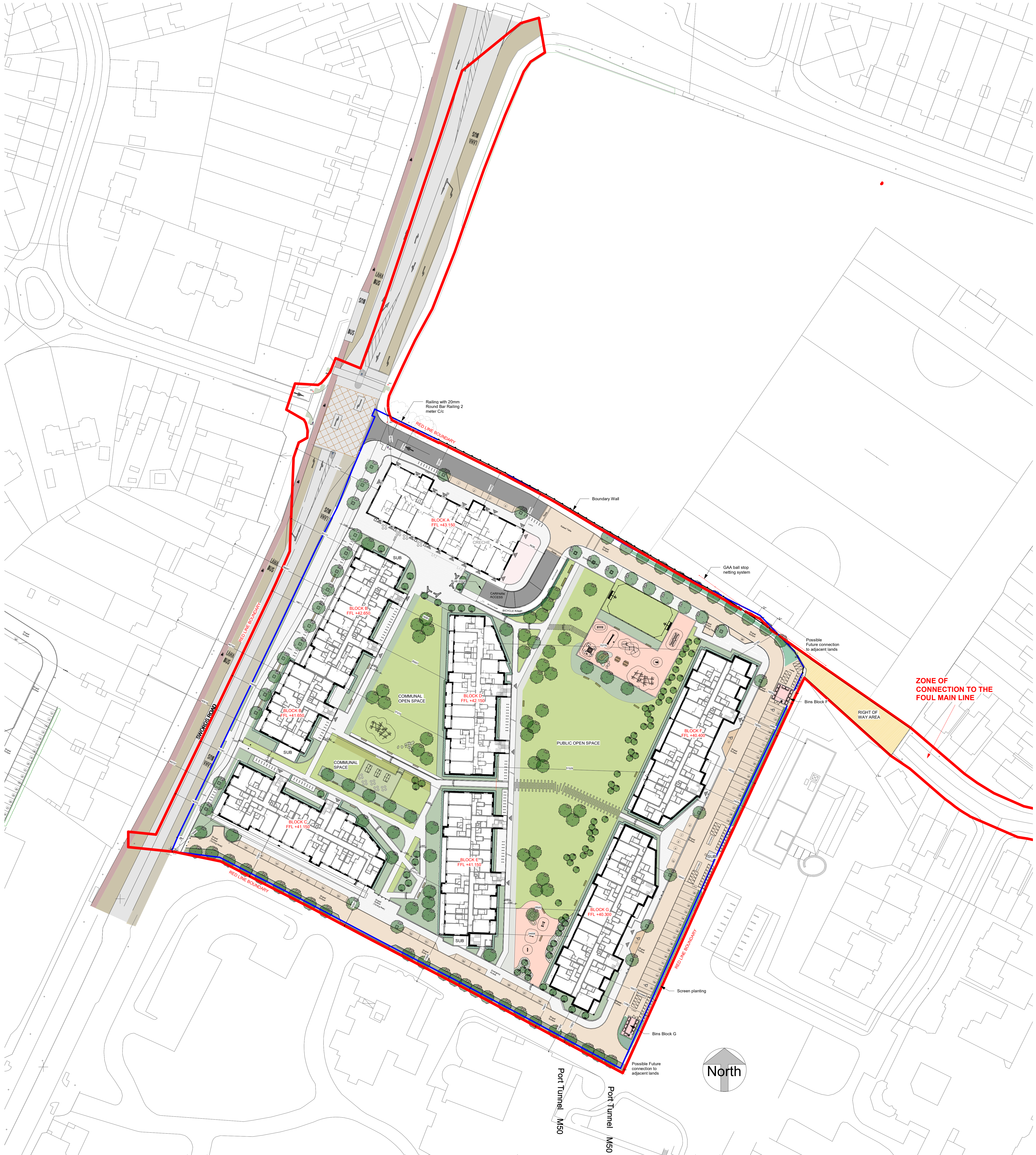
6 REFERENCES

- Office of Public Works.
- Preliminary Flood Risk Assessment (PFRA) Study Maps (<http://www.cfram.ie/pfra/interactive-mapping/>).
- 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)

APPENDIX A

Refer Overleaf for

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

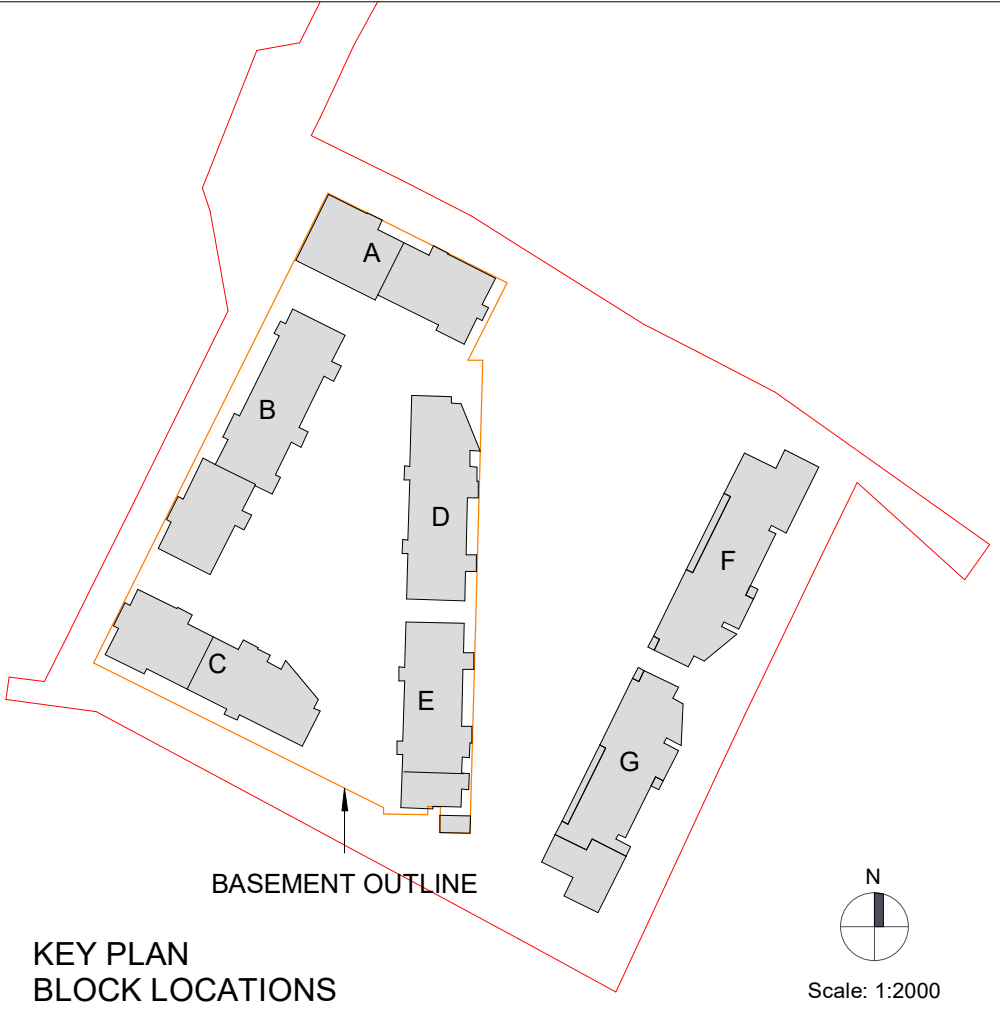


1 SITE PLAN
1:500

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FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING. DO NOT SCALE.
ALL CONTRACTORS MUST VISIT THE SITE AND BE RESPONSIBLE FOR CHECKING ALL SETTING OUT DIMENSIONS AND NOTIFYING THE ARCHITECT OF ANY DISCREPANCIES PRIOR TO ANY MANUFACTURE OR CONSTRUCTION WORK.

NOTES:

DESIGN INTENT DRAWING



APPLICATION BOUNDARY



OWNERSHIP AREA



TOTAL PROPOSED CAR PARKING SPACES

BASEMENT:

- no. 249 RESIDENTS PARKING (5 of them are for electric vehicles)
- no. 5 CRECHE STAFF
- no. 18 ACCESSIBLE PARKING
- no. 5 CAR SHARE / CAR CLUB

SURFACE LEVEL:

- no. 37 RESIDENTS PARKING
- no. 4 ACCESSIBLE PARKING
- no. 15 VISITORS PARKING (5 of them are drop-off parking)

A TOTAL OF 337 CAR PARKING SPACES PROVIDED
313 OF WHICH FOR RESIDENTS

- no. 14 MOTORCYCLE PARKING

- no. 732 SECURE CYCLE SPACES
- no. 236 VISITOR CYCLE SPACES
- no. 14 CARGO BIKE SPACES

A TOTAL OF 862 CYCLE SPACES PROVIDED

Rev	Date	Description	Issued By
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Project Stage

PLANNING

Client:

Eastwise Construction Swords Limited

Project:

Hartfield Place
Swords Road, Whitehall, Dublin 9
D09 C7F8

Drawing Title:

SITE PLAN

Drawn	Checked	Paper Size	Scale	@A0	Date
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DP	CM	A0	As	Indicated	Mar. 2022
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Project No.	Drawing No.	Classification	Revision
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File Name
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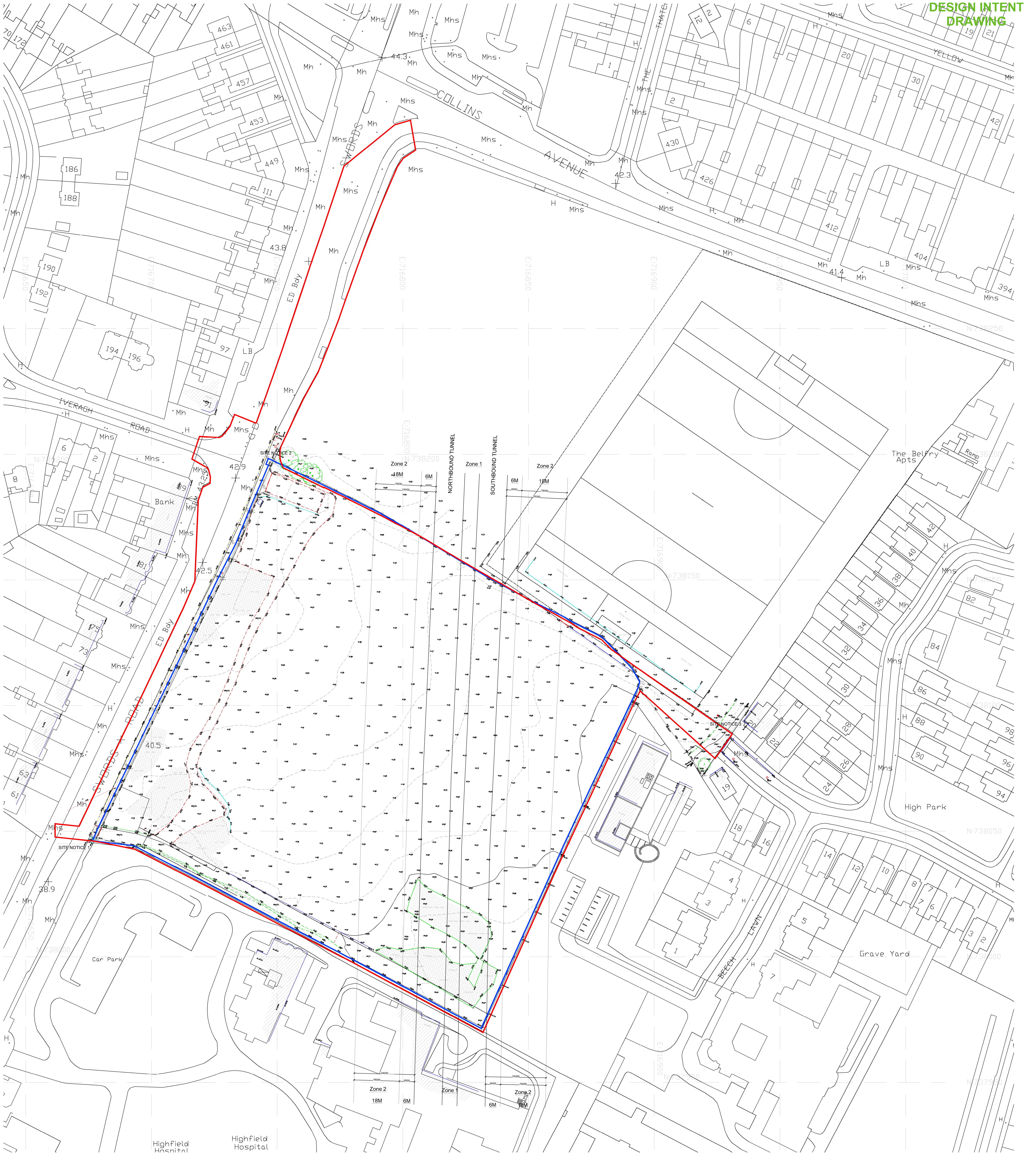
Status:
S2-Suitable For Information

**C+W O'BRIEN
ARCHITECTS**

No. 1 Sarsfield Quay, Dublin 7, D07 R9FH
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DESIGN INTENT
DRAWING

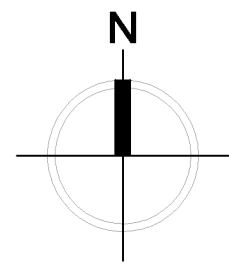


1 Existing Site/ Site Survey
1:500

LEGEND:

APPLICATION BOUNDARY
Site Area: 35,651m² (0.341 ha)
DEVELOPABLE AREA
Site Area: 27,340m² (0.724 ha)

OS MAP REF: 319840, 319842, 319822, 319821
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Rev	Date	Description	Issued By
P01	22/01/2021		

Project Stage

Planning

Client:
Eastwise Construction Limited

Project:
Hartfield Place
Swords Road, Whitehall, Dublin 9
D09 C7F8

Drawing Title:
Existing Site/ Site Survey

Drawn	Checked	Paper Size	Scale	Date
BF	CM	A0	1:500 @ A0	22/01/2021
Project No.	Drawing No.	Classification	Revision	
HARTPL	000501			P01

File Name:
HARTPL-CWO-SM-00-DR-A-000501

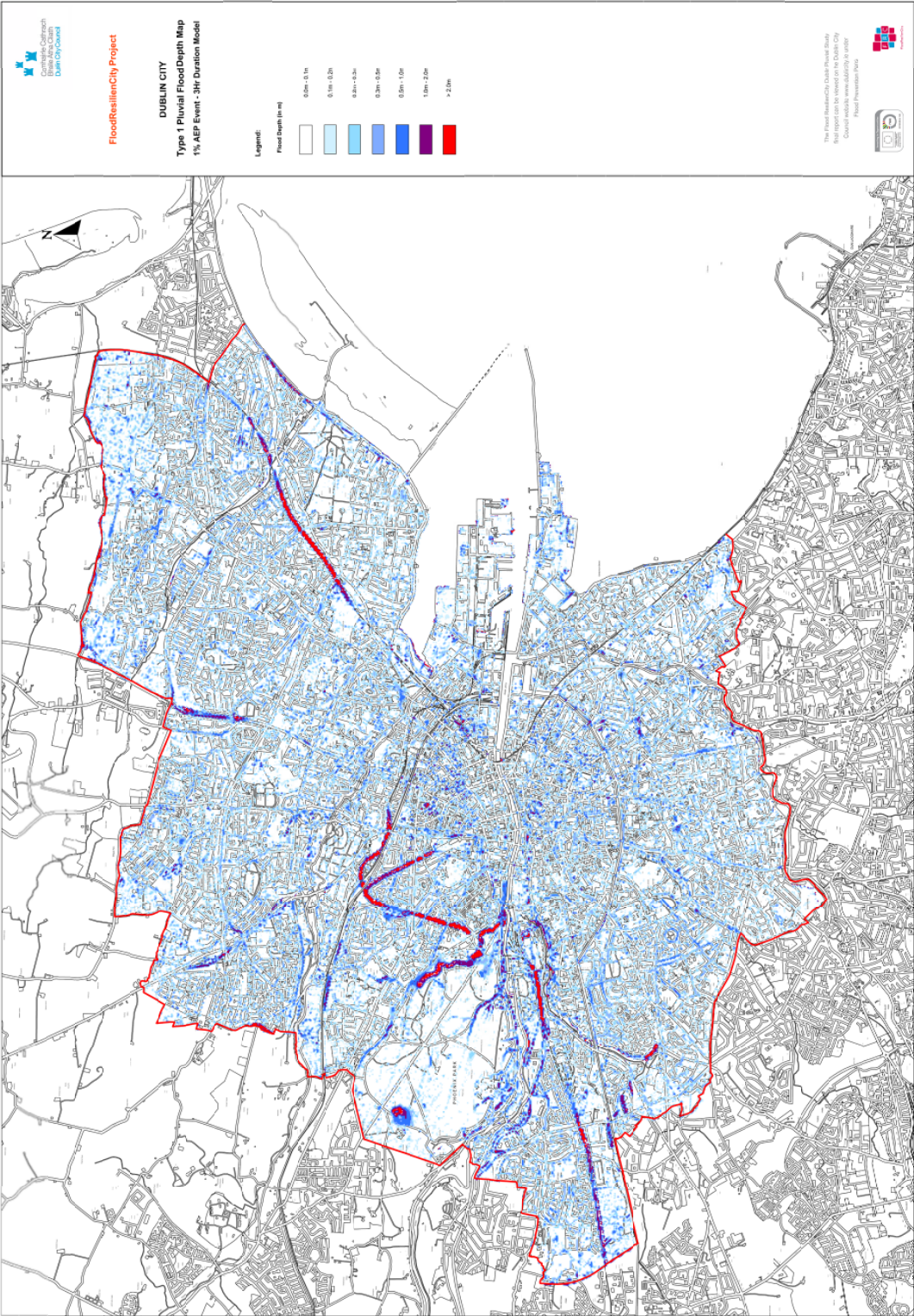
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S2-Suitable For Information

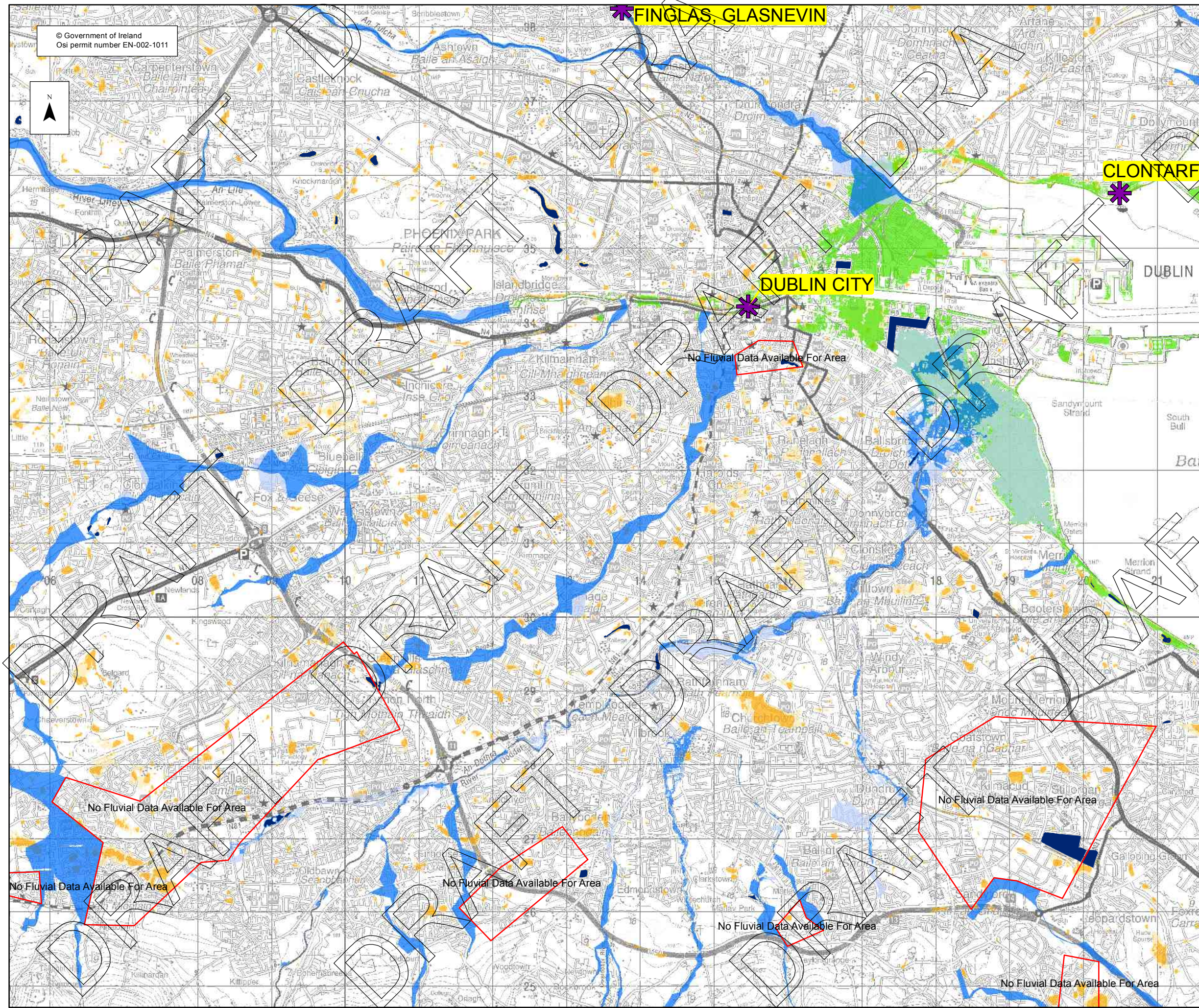
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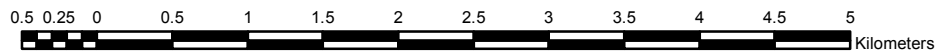
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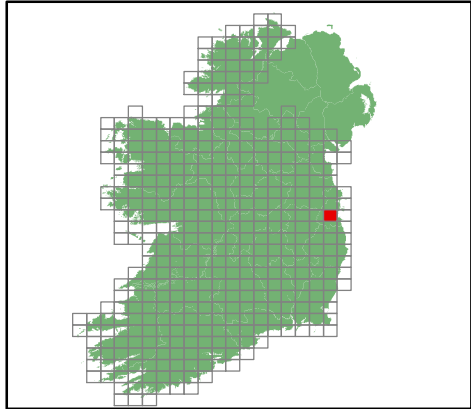




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Location Plan :



Legend:

Flood Extents

- Fluvial - Indicative 1% AEP (100-yr) Event
- Fluvial - Extreme Event
- Coastal - Indicative 0.5% AEP (200-yr) Event
- Coastal - Extreme Event
- Pluvial - Indicative 1% AEP (100-yr) Event
- Pluvial - Extreme Event
- Groundwater Flood Extents

Lakes / Turloughs

PFRA Outcomes

- Probable Area for Further Assessment
- Possible Area for Further Assessment

Important User Note:

The flood extents shown on these maps are based on broad-scale simple analysis and may not be accurate for a specific location. Information on the purpose, development and limitations of these maps is available in the relevant reports (see www.cfram.ie). Users should seek professional advice if they intend to rely on the maps in any way.

If you believe that the maps are inaccurate in some way please forward full details by contacting the OPW (refer to PFRA Information leaflets or 'Have Your Say' on www.cfram.ie).

Office of Public Works
Jonathon Swift Street
Trim
Co Meath
Ireland



Project :
PRELIMINARY FLOOD RISK ASSESSMENT (PFRA)

Map :
PFRA Indicative extents and outcomes
- Draft for Consultation

Figure By : PJW	Date : July 2011
Checked By : MA	Date : July 2011
Figure No. : 2019 / MAP / 238 / A	Revision : 0

Drawing Scale : 1:50,000 Plot Scale : 1:1 @ A3

Past Flood Event Local Area Summary Report

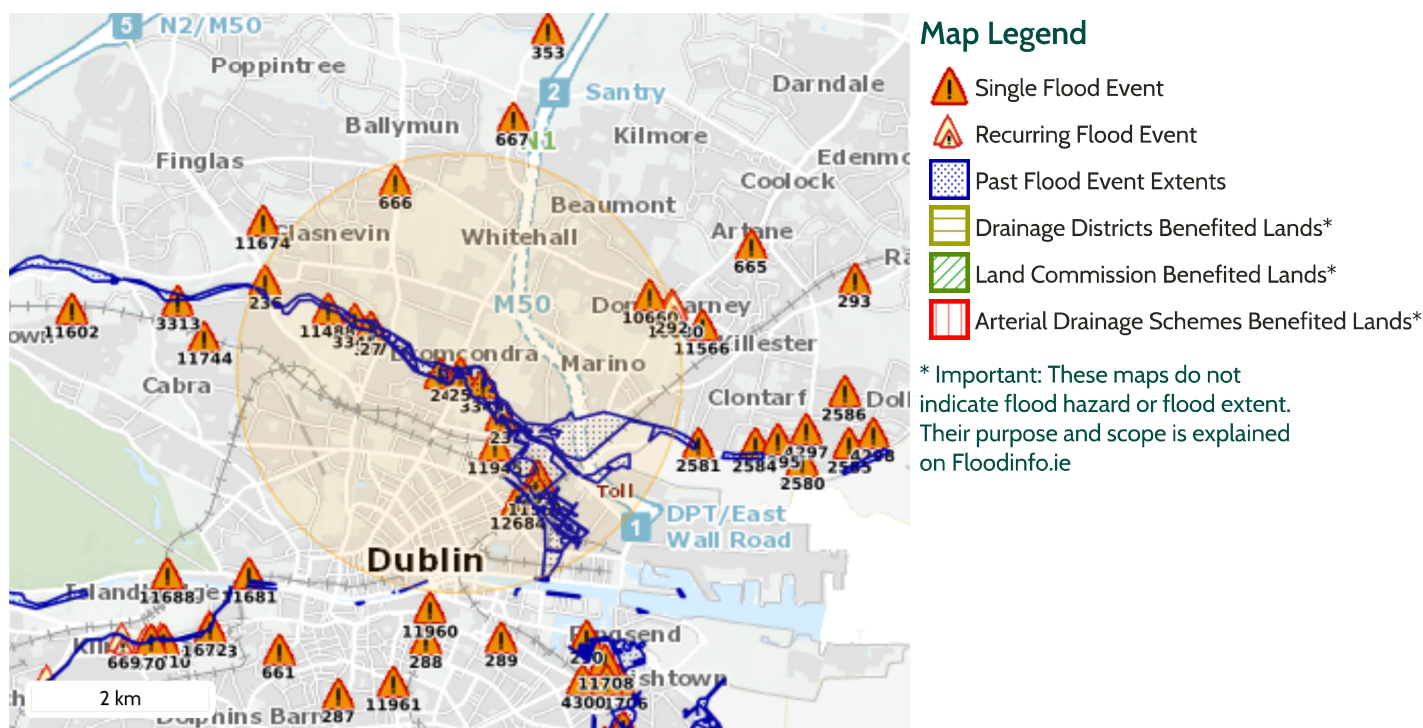


OPW Oifig na nOibreacha Poiblí
Office of Public Works

Report Produced: 21/1/2021 15:38

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.



Map Legend

- Single Flood Event
- Recurring Flood Event
- Past Flood Event Extents
- Drainage Districts Benefited Lands*
- Land Commission Benefited Lands*
- Arterial Drainage Schemes Benefited Lands*

* Important: These maps do not indicate flood hazard or flood extent. Their purpose and scope is explained on Floodinfo.ie

28 Results

Name (Flood_ID)	Start Date	Event Location
1. Flood report for Shamrock Cottages on the 24th October 2011 (ID-12684) Additional Information: Reports (1) Press Archive (0)	24/10/2011	Approximate Point
2. Tolka November 1901 (ID-25) Additional Information: Reports (9) Press Archive (0)	12/11/1901	Approximate Point
3. Tolka September 1931 (ID-26) Additional Information: Reports (12) Press Archive (1)	03/09/1931	Approximate Point
4. Tolka Nov 1968 (ID-27) Additional Information: Reports (5) Press Archive (1)	25/11/1968	Approximate Point
5. Tolka September 1946 (ID-28) Additional Information: Reports (11) Press Archive (0)	20/09/1946	Approximate Point
6. Tolka December 1954 (ID-4) Additional Information: Reports (16) Press Archive (9)	08/12/1954	Area

Name (Flood_ID)	Start Date	Event Location
7.  Tolka October 1880 (ID-21) Additional Information: Reports (8) Press Archive (0)	28/10/1880	Approximate Point
8.  Tolka Nov 1965 (ID-23) Additional Information: Reports (9) Press Archive (2)	25/11/1965	Approximate Point
9.  Tolka Botanic Ave area August 1986 (ID-24) Additional Information: Reports (11) Press Archive (1)	25/08/1986	Approximate Point
10.  Tolka November 1898 (ID-29) Additional Information: Reports (10) Press Archive (0)	23/11/1898	Approximate Point
11.  Tolka November 1915 (ID-30) Additional Information: Reports (11) Press Archive (0)	12/11/1915	Approximate Point
12.  Tolka April 1909 (ID-31) Additional Information: Reports (5) Press Archive (0)	03/04/1909	Approximate Point
13.  Report of flooding at Jones Road, Dublin 3 on 26th July 2013 (ID-11945) Additional Information: Reports (1) Press Archive (0)	26/07/2013	Approximate Point
14.  Tolka Glasnevin August 1986 (ID-3345) Additional Information: Reports (2) Press Archive (0)	25/08/1986	Approximate Point
15.  Tolka November 2002 (ID-5) Additional Information: Reports (143) Press Archive (13)	13/11/2002	Area
16.  Dublin City Tidal Feb 2002 (ID-456) Additional Information: Reports (45) Press Archive (27)	01/02/2002	Area
17.  Tolka Richmond Road Drumcondra Nov 2000 (ID-20) Additional Information: Reports (6) Press Archive (5)	05/11/2000	Approximate Point
18.  Tolka and Finglas Rivers August 1984 (ID-236) Additional Information: Reports (2) Press Archive (0)	26/08/1984	Exact Point
19.  North Strand Road June 1963 (ID-291) Additional Information: Reports (4) Press Archive (2)	11/06/1963	Exact Point
20.  Donnycarney Wad June 1963 (ID-292) Additional Information: Reports (4) Press Archive (2)	11/06/1963	Exact Point
21.  Tolka Jan 2005 (ID-357) Additional Information: Reports (1) Press Archive (0)	07/01/2005	Approximate Point
22.  Wad River Ballymun Dec 1954 (ID-666) Additional Information: Reports (1) Press Archive (0)	08/12/1954	Exact Point
23.  Finglas November 1965 (ID-675)	25/11/1965	Approximate Point

Name (Flood_ID)		Start Date	Event Location
Additional Information: Reports (1) Press Archive (2)			
24.	 Tolka Richmond Road August 1986 (ID-3346)	25/08/1986	Approximate Point
Additional Information: Reports (4) Press Archive (0)			
25.	 Dublin Area O20709 (ID-10660)	02/07/2009	Approximate Point
Additional Information: Reports (1) Press Archive (0)			
26.	 Tolka River 24th Oct 2011 Botanic Gardens (ID-11488)	24/10/2011	Approximate Point
Additional Information: Reports (1) Press Archive (0)			
27.	 Flooding at Bessborough Avenue, North Strand, Dublin 3 on 24th Oct 2011 (ID-11561)	24/10/2011	Exact Point
Additional Information: Reports (1) Press Archive (0)			
28.	 Flooding at Shamrock Place, Cottages and Terrace, Dublin 3 on 24th Oct 2011 (ID-11655)	24/10/2011	Exact Point
Additional Information: Reports (1) Press Archive (0)			