PUNCH consulting engineers

Kingston Park - Public Park and Urban Realm Project

Site Specific Flood Risk Assessment

233114-PUNCH-KP-XX-RP-XX-0008

November 2025

Document Control

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C01	A0	Planning Issue	October 2025	A Keane	E McMillan	M Greene
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1 Introduction

1.1 Background

PUNCH Consulting Engineers were appointed by Galway City Council to carry out a Site-Specific Flood Risk Assessment for their proposed development of a new public park and multi-purpose building. A full project description is included in Section 1.3.

The assessment is carried out in full compliance with the requirements of "The Planning System & Flood Risk Management Guidelines" published by the Department of the Environment, Heritage and Local Government in November 2009 and the Galway City Council Development Plan 2023-2029.

The proposed site layout and buildings is detailed in a series of planning drawings provided by DRLA Landscape Architects, Quinn Architects with Engineering drawings prepared by PUNCH Consulting Engineers.

1.2 Existing Site

The development boundary for the northern part of the Kingston Park site, outlined in red on Figure 1-1, is approximately 3.43 hectares. The southern part of the site, outlined in blue on Figure 1, is approximately 1.62 hectares. The site is bounded by the L10111 road to the North, residential development and land designated for future residential developments to the east, south and west. As well as St. John the Apostle, Knocknacarra National School located at the Northwest of the site. The site is accessed from the Western Distributor Road via the school's access road (L10111), which is not a through route for vehicular traffic. The existing site is a greenfield site with no existing buildings, and the location of the site is shown in Figure 1.

Figure 1: Location of the Proposed development

1.3 Nature of the Proposed Development

The proposed development consists of:

The development of the northern half of the proposed Kingston Park (site area 3.43Ha), including:

- The development of 1 no. 4G synthetic turf multi-sport pitch (designed to 4G synthetic turf multi sport pitch dimensions) with associated fencing and 6 no. floodlights.
- New two-storey, multi-functional building which includes public and sports team changing rooms, toilets, and showers (standard and accessible); double-height general purpose community hall including retractable bleacher seating; multi-purpose activity rooms (including 3 no. rooms offering direct views onto the playing pitch); commentary booth; café and servery; sensory room; first-aid room; store room; plant room; reception area; and roof-mounted solar panels.
- New public spaces and amenities including all-ages play area, outdoor classroom / amphitheatre; internal paths; multi-functional gaming area; informal games lawn; boules pitch; calisthenics area; performance space; pedestrian gateway plaza; parks department staff kiosk; refuse store; sports equipment sheds; public lighting; and public seating.
- Extensive landscape planting (including native genus and species) and nature-based drainage measures including pollinator-friendly raingarden/ bioretention areas; reinforced grass paving; native hedgerows; short- and long-flowering meadows; wildflower gardens; native and naturalised wooded areas; and pollinator-friendly perennials and shrubs.
- Replacement of the existing vehicular site access / junction on the Altan Road, and modification of the new access road approved under permitted Aquatic Centre Development (Pln. Ref. 24/60370) to account for the layout of this proposed development.
- Improvement of existing active travel entrance from Doire Gheal, improved links to the St. John the Apostle, Knocknacarra National School (via a Safe Routes to School), new active travel accesses from the Altan Road, and provision for 2 no. potential future accesses to lands to the east (northeast of Kingston Gardens).
- 50 no. car parking spaces (including 4 no. standard EV charging spaces, 3 no. accessible spaces, 1 no. combined EV and accessible space, and 1 no. age-friendly space), 1 no. coach parking space, 1 no. set-down area, 82 no. bicycle spaces (60 no. standard short-term spaces, and a secure bike shed with 20 no. standard and 2 no. cargo-bike spaces) and 2 no. motorcycle spaces.
- All other associated and ancillary works.

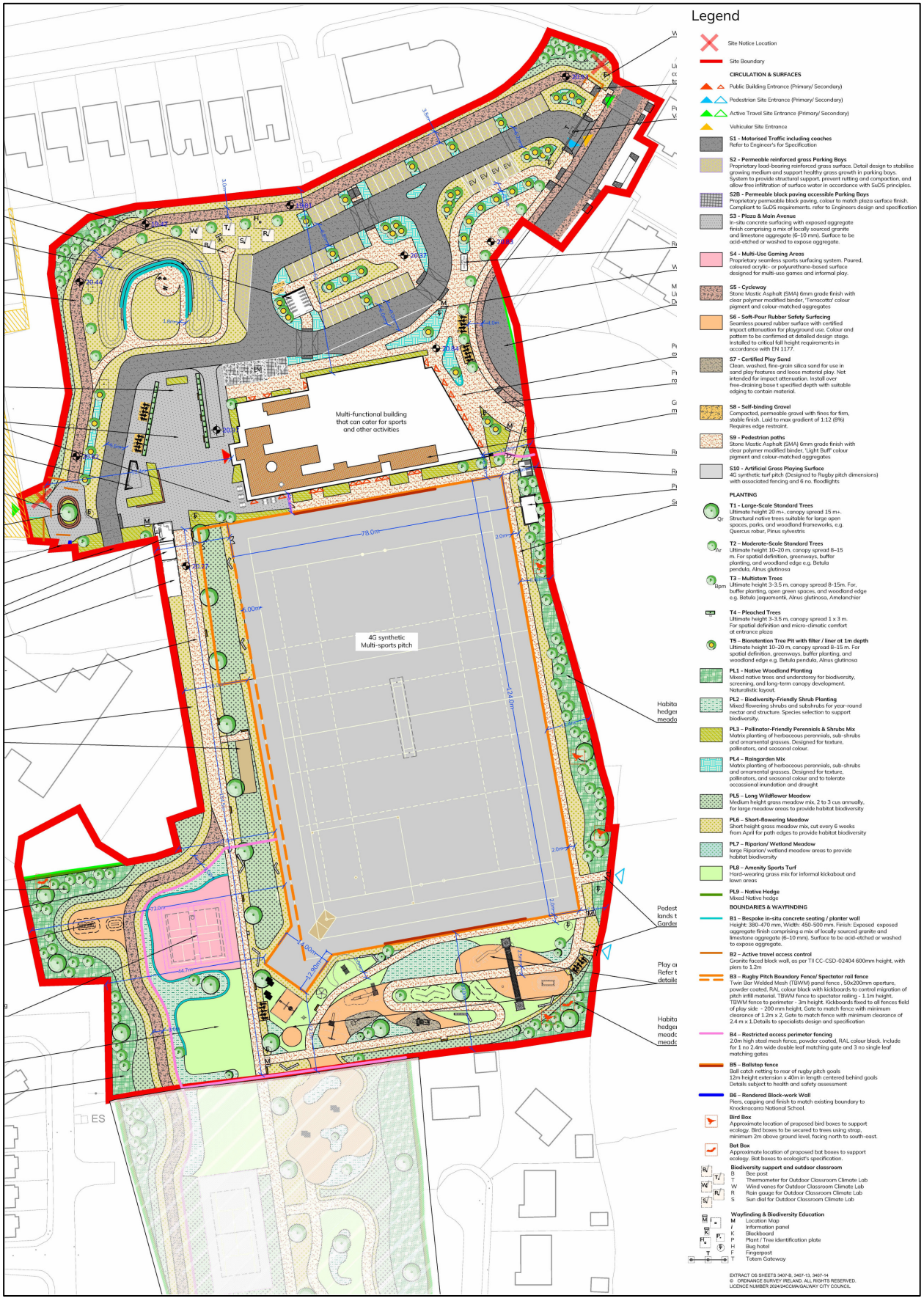


Figure 2: Proposed Site Layout

2 Relevant Guidance

2.1 The Planning System and Flood Risk Management Guidelines

In November 2009, "The Planning System and Flood Risk Management - Guidelines for Planning Authorities" was published by the OPW under the Department of the Environment, Heritage and Local Government.

The flood risk management guidelines provide direction on assessing flood risk in relation to development. They advocate for a precautionary approach when integrating flood risk management into the planning system. A key principle of the guidelines is the application of a sequential approach to flood risk management, prioritising the avoidance of development in high-risk areas. This approach relies on identifying flood zones for both river and coastal flooding. The guidelines define Flood Zones A, B, and C, as outlined in Table 2-1. Notably, these zones do not consider existing flood defences.

Table 2-1: Flood Zone Designation

Flood Zone	Type of Flooding	Annual Exceedance Probability (AEP)
Flood Zone A	Coastal	Less than a 1:200 (0.5% AEP) year event
	Fluvial	Less than a 1:100 (1% AEP) year event
Flood Zone B	Coastal	Greater than a 1:200 (0.5% AEP) and less than a 1:1000 (0.1% AEP) year event
	Fluvial	Greater than a 1:100 (1% AEP) and less than a 1:1000 (0.1% AEP) year event
Flood Zone C	Coastal	Greater than a 1:1000 (0.1% AEP) year event
	Fluvial	Greater than a 1:1000 (0.1% AEP) year event

After identifying a flood zone, the guidelines specify the types of development suitable for each zone. In certain cases, exceptions to development restrictions due to flood risk can be made through the Justification Test. This test requires demonstrating both the planning need for the development and the ability to sustainably manage flood risk to an acceptable level. It acknowledges that future development may be necessary in established towns and urban centres within flood risk zones and that completely avoiding development in these areas would be unsustainable. A three staged approach to undertaking an FRA is recommended:

Stage 1: Flood Risk Identification – Identification of any issues relating to the site that will require further investigation through a Flood Risk Assessment.

Stage 2: Initial Flood Risk Assessment – Involves establishment of the sources of flooding, the extent of the flood risk, potential impacts of the development and possible mitigation measures.

Stage 3: Detailed Flood Risk Assessment – Assess flood risk issues in sufficient detail to provide quantitative appraisal of potential flood risk of the development, impacts of the flooding elsewhere and the effectiveness of any proposed mitigation measures.

This report addresses the requirements for Stage 1 only.

2.2 Galway City Development Plan 2023-2029

The Galway City Development Plan 2023–2029, adopted by the Elected Members of Galway City Council on 24 November 2022 and effective from 4 January 2023, establishes a strategic framework for planning and sustainable development within Galway City.

Chapter 9 of the Plan addresses *Environment and Infrastructure*, with **Section 9.2** specifically focused on *Flood Risk Management*. The following policies are outlined:

1. **Compliance with National and EU Legislation**

   Support, in collaboration with the Office of Public Works (OPW), the implementation of the EU Flood Risk Directive (2007/60/EC), the Flood Risk Regulations (SI No. 122 of 2010), and relevant planning guidelines, including the Planning System and Flood Risk Management Guidelines (2009). Regard shall be given to the findings and actions of the Corrib Catchment Flood Risk Management (CFRAM) Study.

2. **Implementation of Flood Relief Measures**

   Facilitate the delivery of the *Coirib go Cósta Galway City Flood Relief Scheme* in partnership with the OPW to enhance climate resilience, mitigate flood risks, and minimise the impact of future climate events. Associated mitigation and adaptation measures shall be supported, subject to environmental, visual, heritage, and other relevant considerations.

3. **Strategic Flood Risk Assessment (SFRA) Integration**

   Ensure that the recommendations of the SFRA are incorporated into the assessment of development proposals within identified flood risk areas. Site-specific Flood Risk Assessments (FRAs) and appropriate design and construction measures shall be required, even where only a portion of a site is at risk. A sequential approach shall be adopted in accordance with national planning guidelines.

4. **Protection of Water Bodies and Riparian Zones**

   Safeguard rivers, streams, wetlands, undeveloped riparian strips, and natural floodplains from inappropriate development to promote sustainable water management.

5. **Flood Risk in Future Planning**

   Integrate flood risk considerations into the preparation of future Local Area Plans, Framework Plans, and Masterplans within the city.

6. **Environmental Assessment of Flood Mitigation Measures**

   Ensure that any proposed flood or coastal erosion mitigation measures are subject to Appropriate Assessment under Article 6 of the EU Habitats Directive, where applicable.

7. **Coastal Protection**

   Continue to protect coastal areas and the foreshore by preventing inappropriate development in erosion-prone zones and avoiding actions that may exacerbate erosion in adjacent areas.

8. **Preservation of Riparian Zones and Floodplains**

   Protect and maintain, where feasible, undeveloped riparian zones and natural floodplains along the River Corrib and its tributaries.

Strategic Flood Risk Assessment Report

Policy 9.1 Flood Risk *"Ensure the recommendations of the Strategic Flood Risk Assessment (SFRA) for the Galway City Development Plan 2023-2029 are taken into consideration in the assessment of developments in identified areas of flood risk and require site specific Flood Risk Assessment (FRA) and associated design and construction measures appropriate to the scale and nature of the development*

and the risks arising, in all areas of identified flood risk including on sites where a only small proportion of the site is at risk of flooding and adopt a sequential approach in accordance with the Planning System and Flood Risk Management Guidelines for Planning Authorities (2009).”

2.3 Land Zoning

The land proposed for development is currently zoned as “RA: Recreation and Amenity” under the Galway City Development Plan. A portion of the site is also zoned as “R: Residential.” The surrounding areas are primarily zoned for residential use, with adjacent zoning designated as “CF: Community, Cultural, and Institutional,” which is intended to integrate with the proposed development. This zoning context is illustrated in Figure 3.

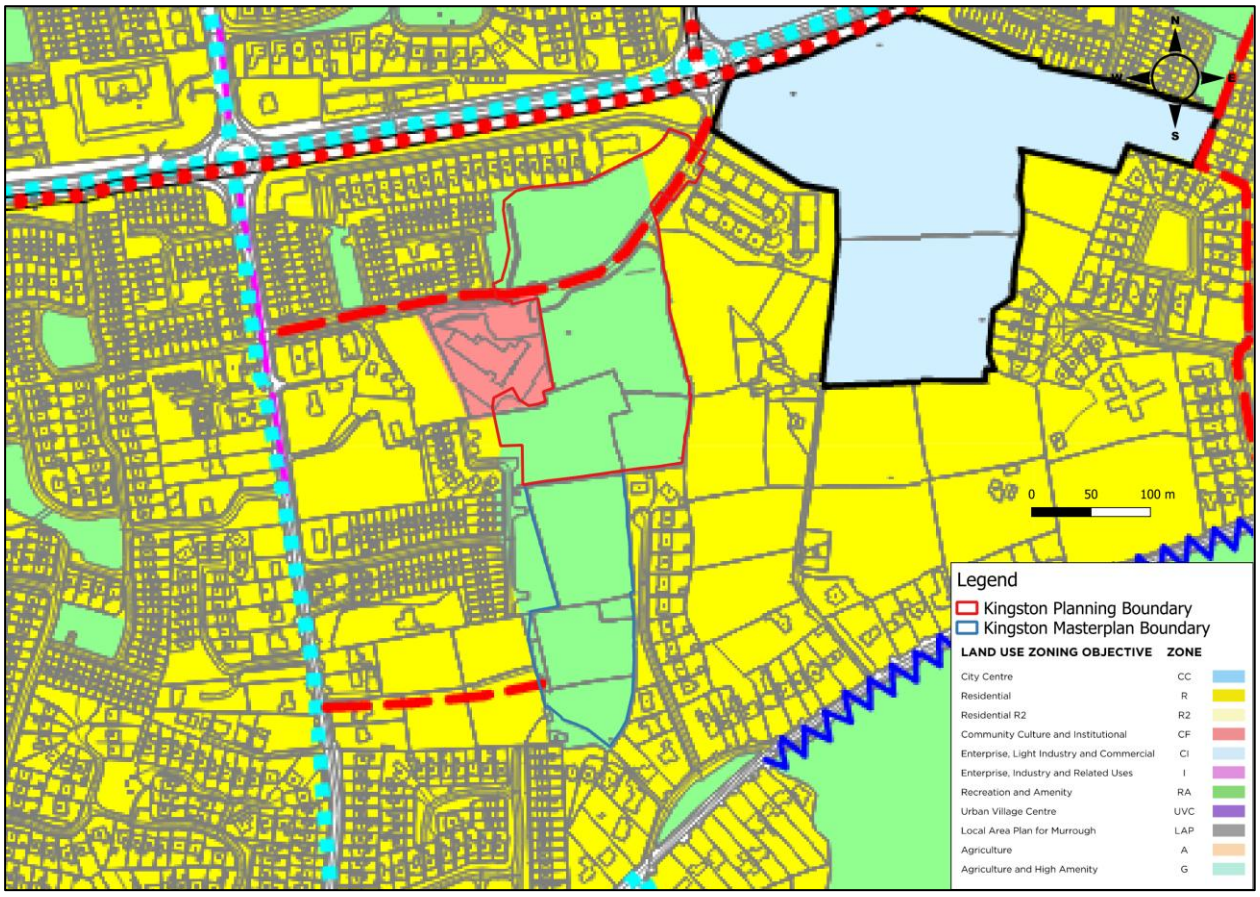


Figure 3: Galway City Development Land-Use Zoning (2023-2029)

2.4 Flood Risk Management Plan

The OPW publish Flood Risk Management Plans detailing the feasible range of flood risk management measures proposed for their respective river basins. Currently there is no Flood Risk Management Plan in place for Knocknacarra. The current level of risk will be reviewed, along with all areas, on a regular basis into the future.

3 Flood Risk Identification

3.1 Existing Hydrogeological Environment

The existing hydrological environment is characterised primarily by the presence of The Knocknacarragh Stream (Clybaun Stream) which flows through Knocknacarra before joining Rusheen Bay. The

Ballymoneen and Tonabrocky streams join the Knocknacarragh to the north of the site. The river is the closest watercourse to the site location, flows through the north of the site and along the west of the site as far as Clybaun Court residential estate. The hydrological environment around the site is shown in Figure 4.

Figure 4: Hydrological Environment surrounding the site (Ref:Google Maps)

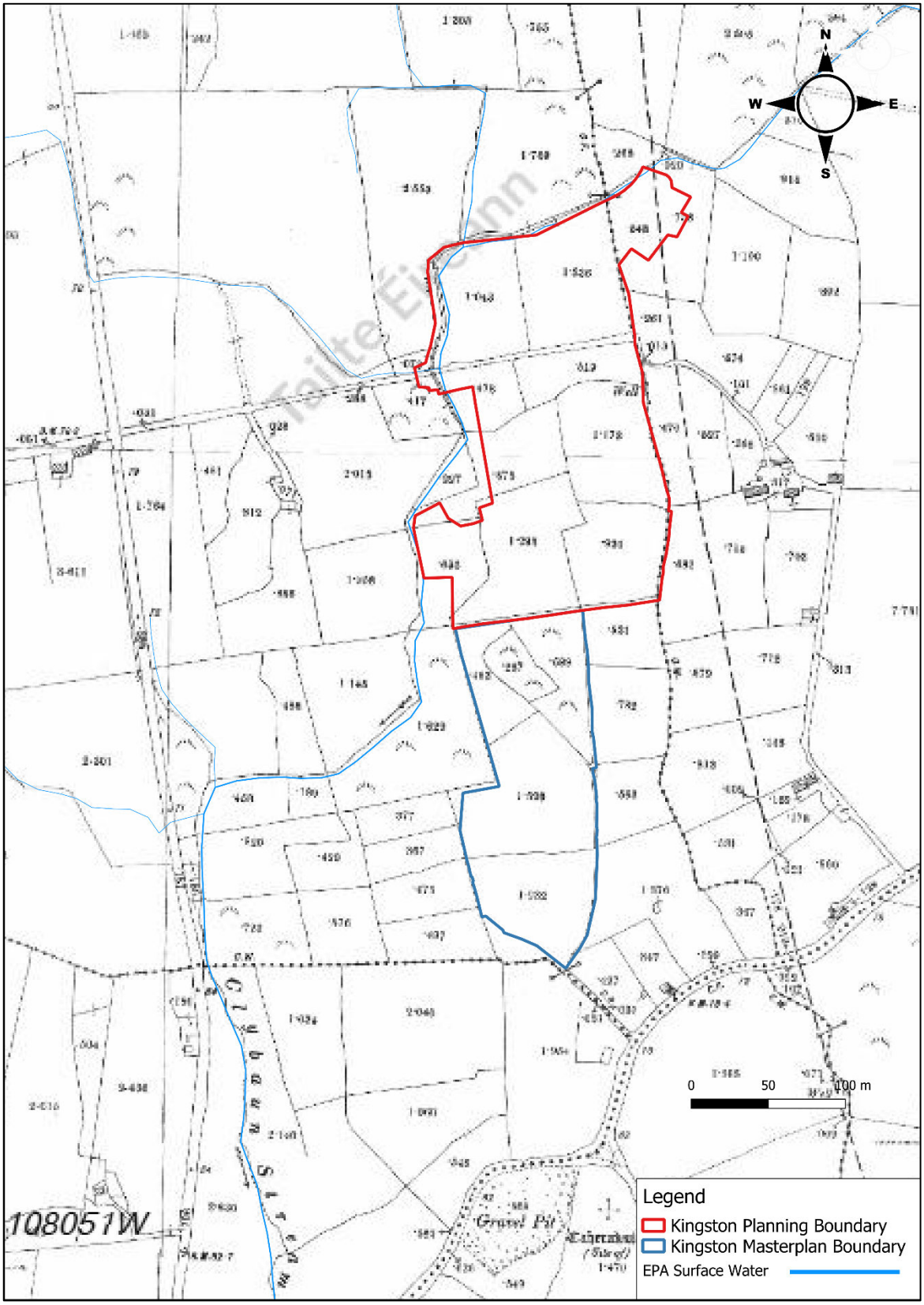


Figure 5: Hydrological Environment surrounding the site on historical 25" Map (Ref:GeoHive)

3.2 Topographical Survey

A comprehensive topographical survey was conducted for the designated project site by NCW Surveys in April 2025. Please see Figure 6.

The findings from this survey indicate that the terrain to the north of the access road is predominantly flat ranging from a height of 20.23mAOD to 19.1mAOD. The terrain to the south of the site is generally uneven, with elevations from a peak height of 24.6 metres above ordnance datum (mAOD) in the southeast of the site to 18.95 mAOD in the northwest and through the centre of the site, resulting in an elevation differential of approximately 5.6 metres across this section.

Figure 6: Existing ground elevation for the site with 1.0m Contours (Ref: QGIS)

3.3 Site Walkover

PUNCH Consulting Engineers visited the site on 20th May and 5th June 2025 to assess the conditions and key features of the site, to establish any potential sources of flooding and to identify the likely routes of flood waters. Appendix A contains a selection of key images taken during the site visits.

The following was established from the site visit:

a) The site was accessed via the existing L10111 and is sometimes known as the Áltan Road.
b) Ground was dry at the time of the visit. There was no evidence of any rushes on site.
c) There was no standing water present on site.
d) No external flow paths were encountered during the site visit. There is a ditch evident in the northwest of the site but this is the remnants of an old stream that has since been culverted.
e) North of the L10111 is predominately flat. The site to the south of the L10111 is quite undulating.

Figure 7: View from L10111 looking south

Figure 8 View from School looking north where remnants of old watercourse exist

3.4 History of Flooding

The OPW Flood Hazard Mapping Website is a record of historic flood events. This database indicates that there is no record of flooding incidents on site of the proposed development. Please note that this is not a guaranteed record of all flood events.

There are 7 no. recorded flood events within 2.5 kilometres of the site. Details of these are provided below;

Flood summary ID - 13235 - Flooding at Salthill on 01/12/2015

Date: 01/12/2015

Flood Source: Coastal Flooding

Flood Summary ID - 12142 - Flooding in Galway and Salthill on 18/12/2013

Date: 18/12/2013

Flood Source: Coastal Flooding

Report: Completed 24/03/2014 "Flooding in Galway and Salthill 18th December 2013"

Flood summary ID - 14072 - Flooding at Salthill Promenade Galway on 18/12/2019

Date: 18/12/2019

Flood Source: Coastal Flooding

Flood summary ID - 13056 - Flooding at Salthill on 01/02/2014

Date: 01/02/2014

Flood Source: Coastal Flooding

Flood summary ID -13684 - Flooding at Galway City/ Salthill on 13/01/2020

Date: **13/01/2020**

Flood Source: Coastal Flooding

Flood summary ID - 13643- Flooding at Galway City on the 08/02/2019

Date: 08/02/2019

Flood Source: Coastal Flooding

Flood summary ID - 12143- Flooding in Galway and Salthill on 01/02/2014

Date: 01/02/2014

Flood Source: Coastal Flooding

Report: Completed 24/03/2014 "Flooding in Galway and Salthill on 1st February 2014"

These extents of these flood events are shown below in Figure 9 and it can be determined that the proposed site is not at risk of flooding associated with these areas.

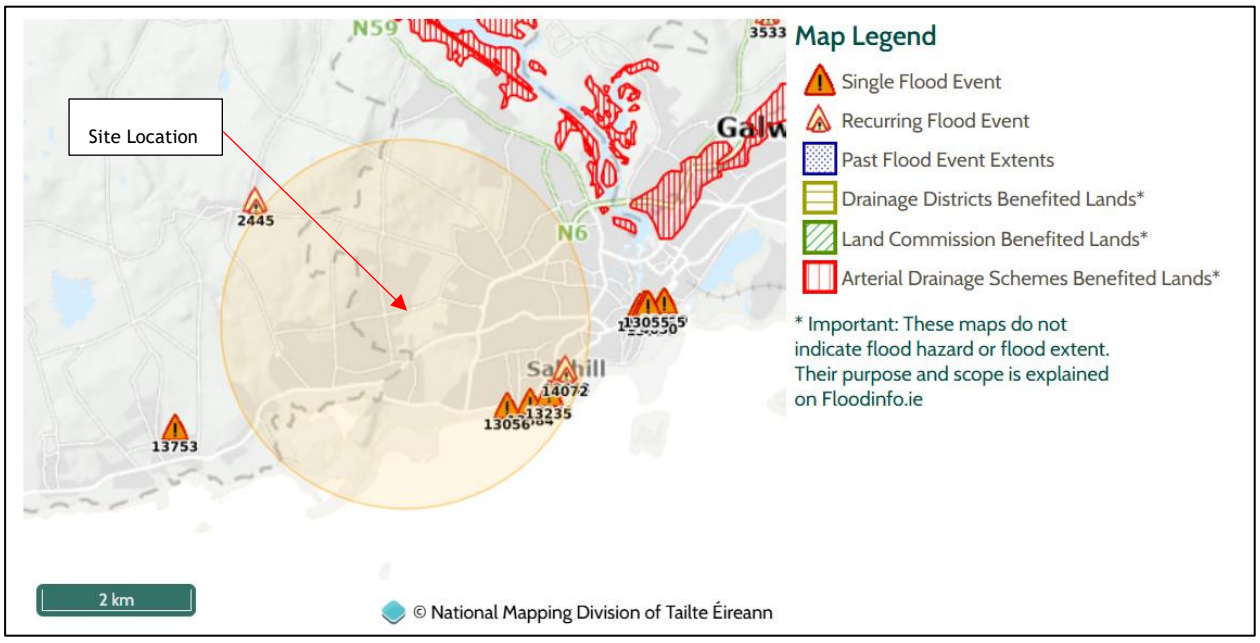


Figure 9: Extract from OPW Floodmaps Database Report (see Appendix B for full report)
http://www.floodmaps.ie/index.aspx?ReturnUrl=%2fView%2fDefault.aspx

3.5 Review of Historic Mapping

A review of the OSI Historical maps was carried out. Figure 10 shows an extract from the six-inch historic map for the site. The site is not indicated as "liable to flood" in the available historic OSI maps.

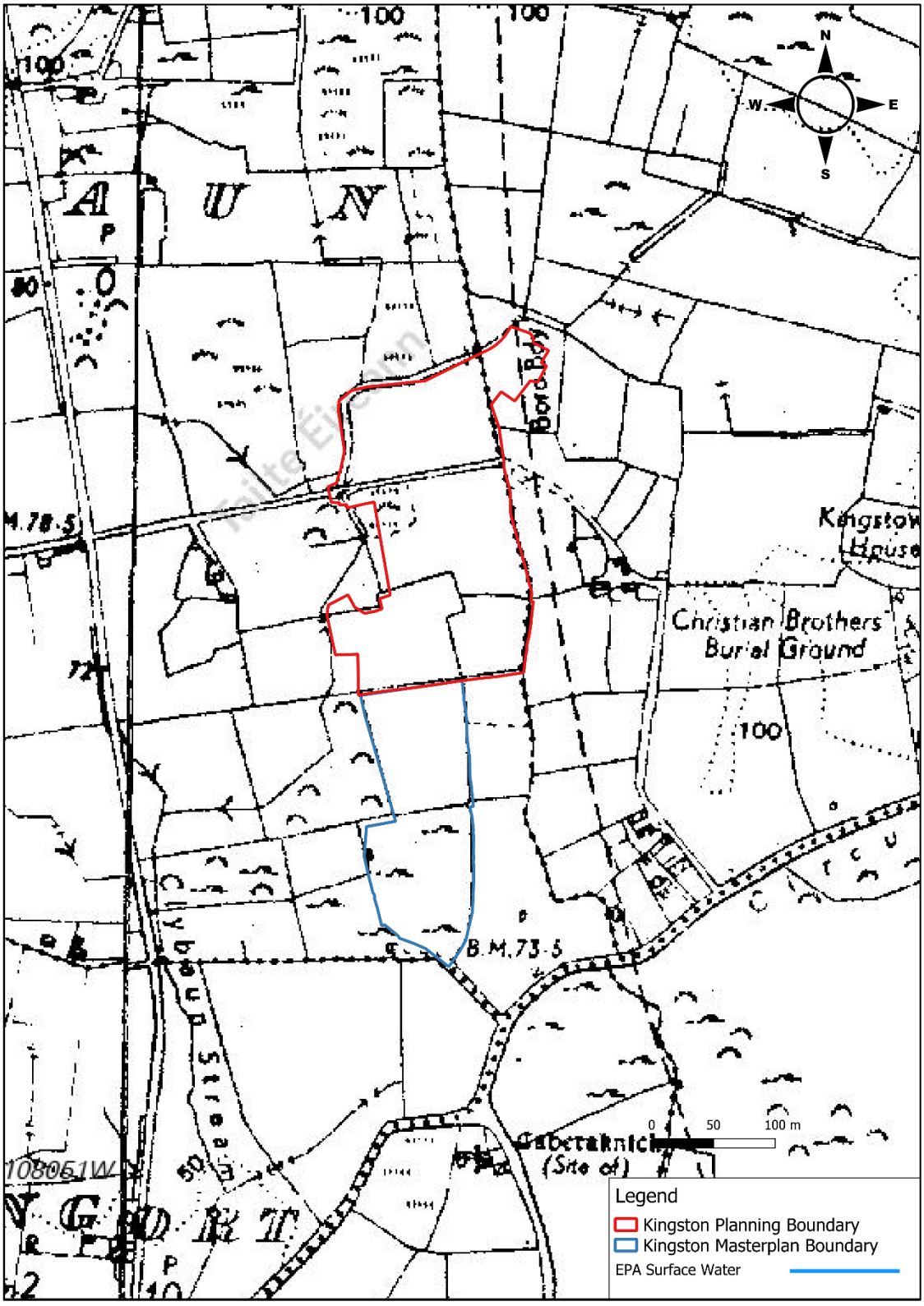


Figure 10: Extract from OSI historical 6" Map First Edition (Ref: GeoHive Map Viewer)

3.6 Geophysical Site Investigation

A geophysical survey was undertaken on the 21st and 27th of May 2025 by Minerex Geophysics Limited. The purpose of the survey was to determine the depth of rock and to estimate the strength, stiffness or compaction of the overburden and the rock quality. The survey consisted of seismic refraction (p-wave) measurements spread evenly throughout the site.

Table 3-1 below shows the summary of interpretation of the results of the survey. The stiffness or compaction of overburden and the rock strength or quality have been estimated from the seismic velocity. The survey has identified four layers ranging from loose soil to granite rock.

Table 3-1 Summary of Interpretation of results

Layer	General Seismic Velocity Range (m/sec)	Thickness of Layer	Stiffness or Compaction or Rock Quality	Interpretation	Estimated Excavation Method
1	100-300	0.1-2.9m	Soft or Loose	Soil	Diggable
2	600-1100	0.1 – 2.9m	Stiff or Dense Overburden or Very Poor Rock	Overburden or Highly Weathered Granite	Diggable or some breaking of boulders
3	1800-2100	0.5 – 7.8m	Fair Rock	Weathered Granite	Rippable or Marginal rippable or some breaking
4	3500-4500	2.4 – 12.5m	Good Rock	Granite	Breaking or Blasting

3.7 Site Geology

The geology of the site was reviewed using data from the Geological Survey of Ireland (GSI) available at www.gsi.ie.indicates that the site is underlain by till derived from Granite. Urban sediment underlies the area just south of the site. Refer to Figure 11.

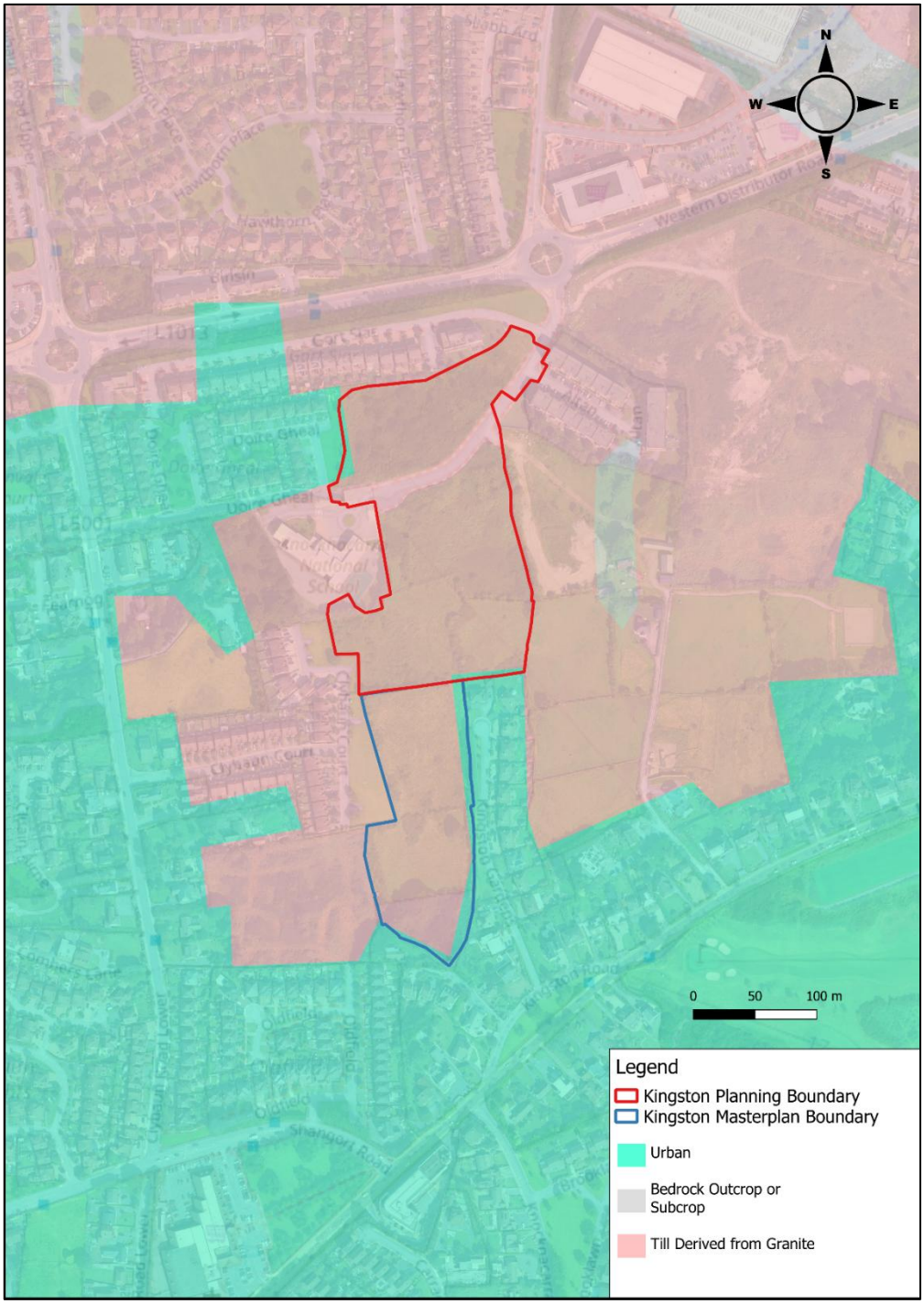


Figure 11: Quaternary Sediments Map (image taken from GSI)

3.8 Groundwater Flooding

From a review of the Geological Survey of Ireland database, there appears to be no identifiable groundwater flood risk within or near the site. It can be determined that there is a low risk of groundwater flooding on site. Please see Figure 12.

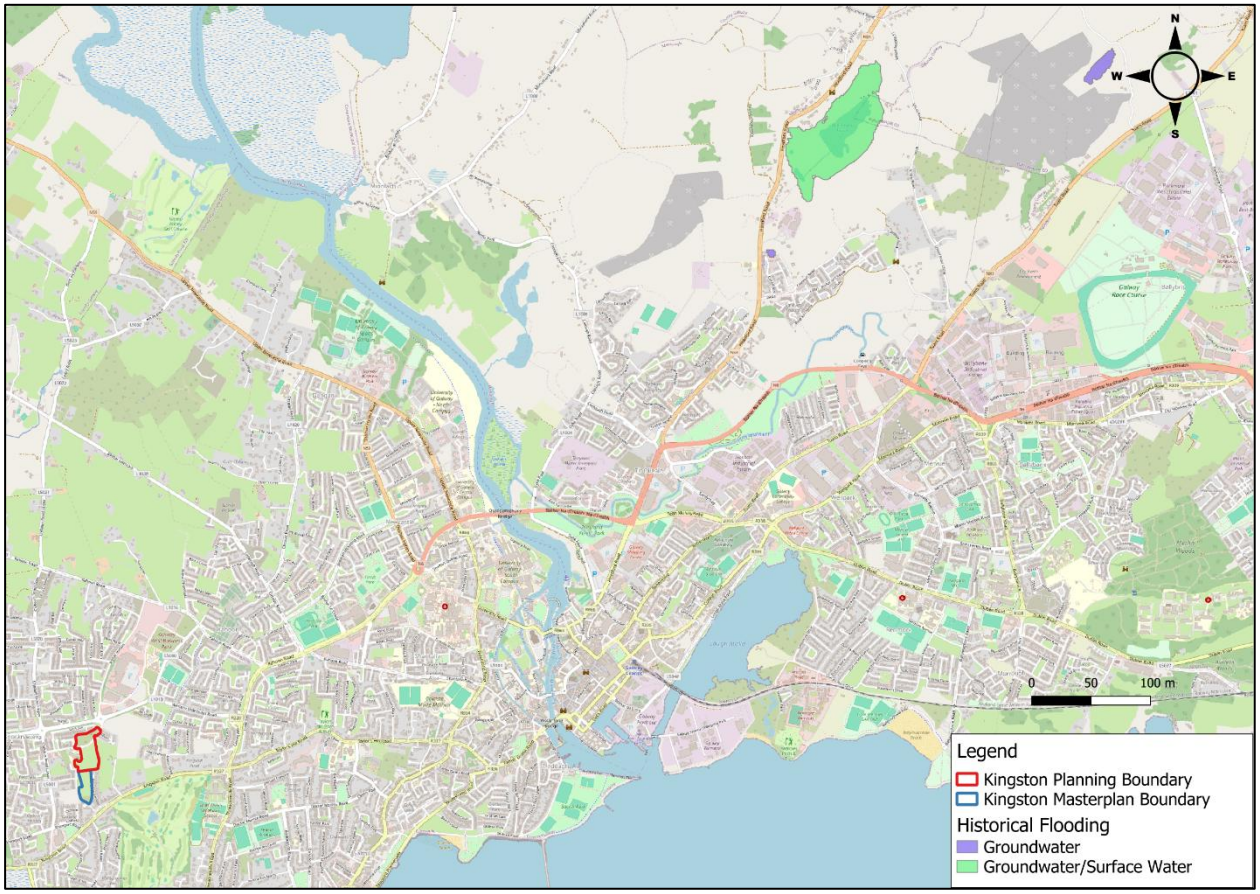


Figure 12: GSI Groundwater Flooding Data (Ref: Groundwater Flooding Data Viewer)

3.9 Groundwater Vulnerability

The location of the proposed site lies mainly in a region that has a High to Extreme groundwater vulnerability rating, with about 70% of the site in the high-ground vulnerability section. The groundwater vulnerability is based on the predicted time taken for a pollutant released to the ground at surface level to reach an aquifer. Groundwater vulnerability mapping is presented in Figure 13.

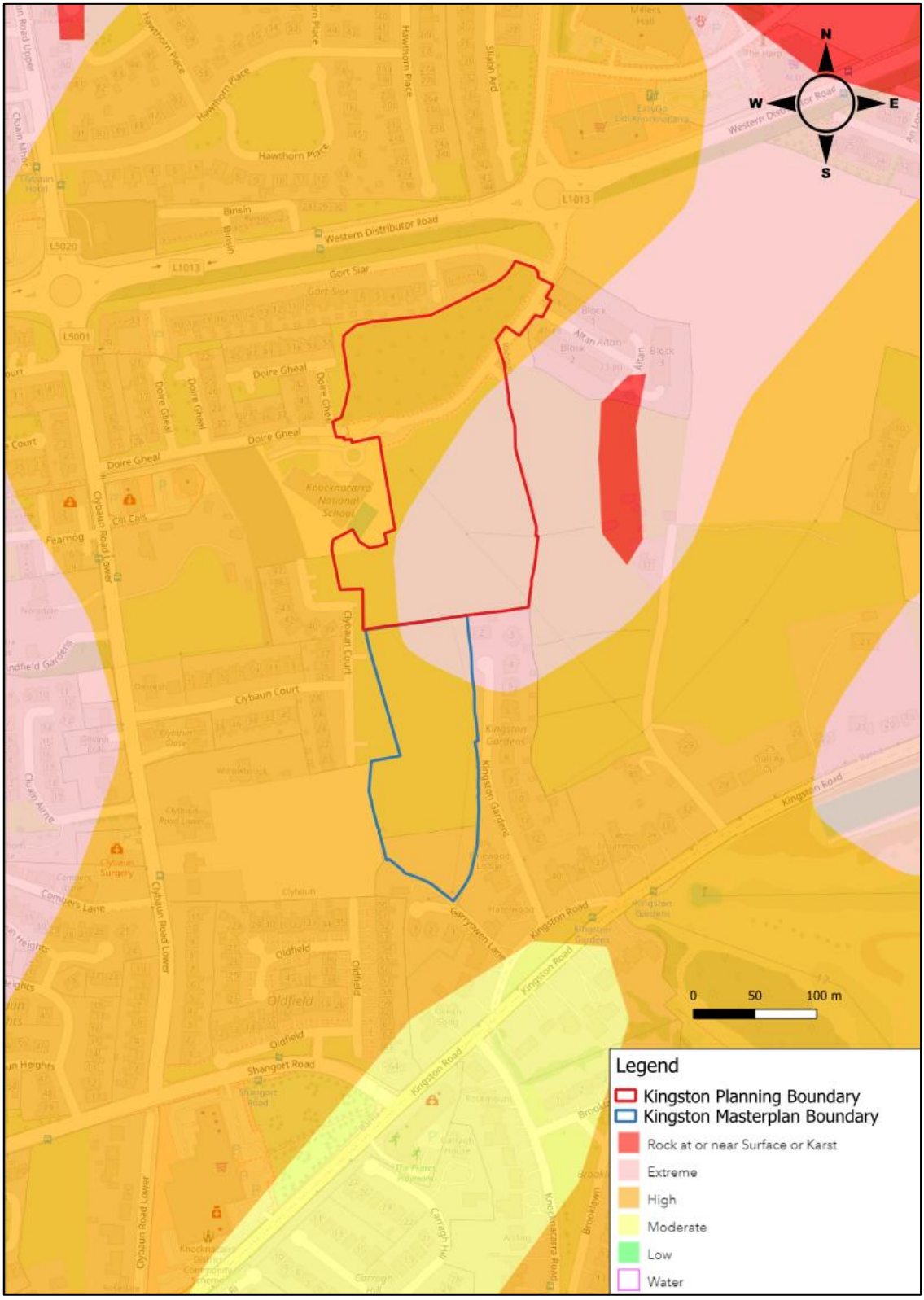


Figure 13: Groundwater Vulnerability Map (image taken from GSI)

3.10 Pluvial Flooding

Pluvial flooding is the result of rainfall-generated overland flows which arise before run-off can enter any watercourse or sewer. It is usually associated with high intensity rainfall.

The provision of a suitable surface water drainage system for the proposed development on the site will mitigate against pluvial flood risk as demonstrated in the accompanying Engineering Planning Report. The redevelopment of the site will not adversely affect pluvial flood levels or extents.

3.10.1 Review of Existing Surface Water Infrastructure

A review of the surface water drainage network in the area was undertaken based on Irish Water and GCC GIS database network as well as analysing existing record drawings provided by Uisce Éireann. This enabled a detailed understanding of the surface water infrastructure in place as shown in Figure 14 and Figure 22.

A review of the EPA's River network GIS database suggested that at some point a stream flowed through in Kingston Park, as seen in Figure 14 referenced by the EPA as Knocknacarragh_10. A further review of the historical mapping starting with the old six-inch mapping and the twenty-five-inch mapping was undertaken. The historical mapping identified a stream that coincides with the EPA GIS database. Both maps show lines with arrows depicting a stream, referred to on the maps as the Clybaun Stream, as seen in Figure 15 and Figure 16.

The earliest available aerial imagery on the Geohive website is 1995. There is also aerial imagery from 1996, 2001, 2006 and 2013. These images depict the rapid transformation of Knocknacarra area of Galway City and the speed at which residential and commercial development occurred during this period. What is clear in the 1995 and 1996 aerial imagery is that the Clybaun Stream does exist and is clearly identifiable in these images. It is also clear that the 1995 aerial imagery shows the southern section of the Clybaun Stream, adjacent to the Clybaun Road and further down towards Shangort Road has been piped to facilitate residential development in the area. The 1996 aerial imagery also shows piping of the Clybaun Stream commencing to the north of Kingston Park on the south side of the Western Distributor Road and through the Clybaun Court residential development. It is worth noting that the 1996 aerial imagery clearly shows the watercourse as an open channel in the northeastern park of Kingston Park and on the site where Knocknacarra NS is currently built, as seen in Figure 17 and Figure 18.

The aerial imagery from 2001 shows the Clybaun Stream as being piped underground upstream of Kingston Park red line boundary, along the northern boundary with Gort Siar and through Clybaun Court residential estate. It does appear open channel just south of Gort Siar to Clybaun Court, as seen in Figure 19.

Between 2001 and 2006 Knocknacarra NS was constructed along with the access road extending from Áltan Apartments to the school. Reviewing the aerial imagery, it seems that the Clybaun Stream was completely piped underground between 2001 and 2006. Figure 20 shows the aerial imagery of the network in 2006.

A review of the surface water drainage assets GIS database shows a 1,800mm diameter exists and coincides with the route of the Clybaun Stream as per the EPA River Network GIS database, as seen in Figure 21 and Figure 22. A query relating to the piping of the Clybaun Stream was lodged with Galway City Council Engineers, and their response of the 25th July 2025 is that they are almost certain that the 1,800mm diameter pipe is taking the stream.

Based on this assessment, the stream that flows to the northwest of the subject site has been channelled as a 1,800mm diameter piped surface water system, eliminating the need for a Section 50 application. The assessment indicated that the surface water on the subject site is directed through this 1,800mm diameter pipe.

Figure 14 EPA River Network
***Extract from EPA Maps**

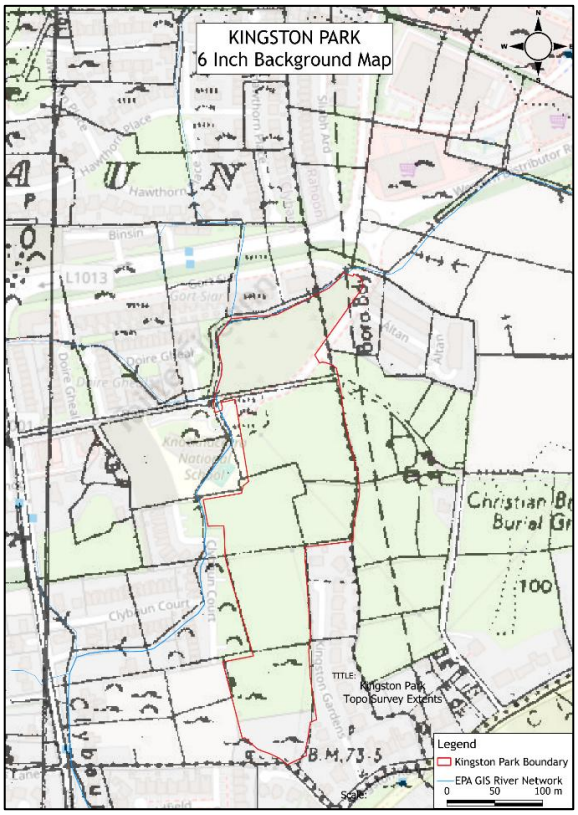


Figure 15 Six Inch Mapping
***Extract from GSI Website**

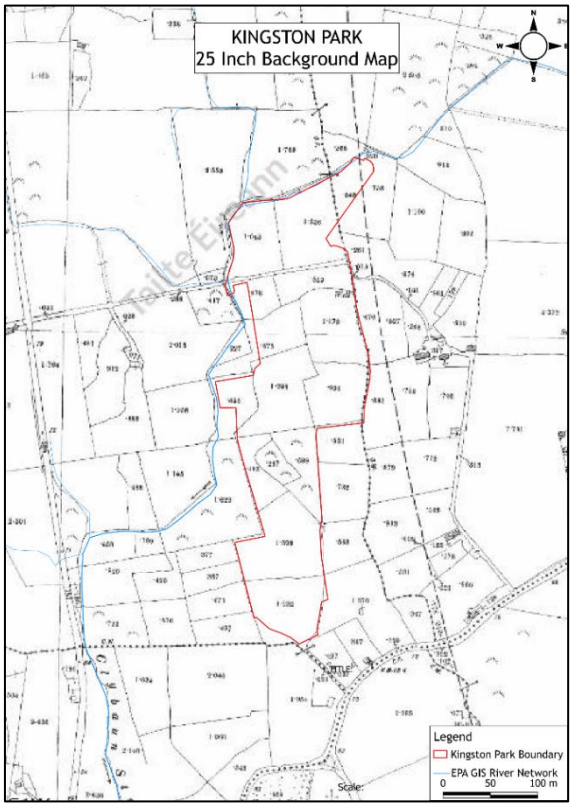


Figure 16 Twenty-Five Inch Mapping
***Extract from GSI Website**

Figure 17 Aerial Imagery 1995
***Extract from Geohive Website**

Figure 18 Aerial Imagery 1996
***Extract from Geohive Website**

Figure 19 Aerial Imagery 2001
***Extract from Geohive Website**

Figure 20 Aerial Imagery 2006
***Extract from Geohive Website**

Figure 21 Surface Water Network
***Extract from Uisce Éireann Service Records**

Figure 22: Irish Water Record Drawing - Stormwater Sewers (Ref: QGIS)

3.11 Fluvial Flooding

Fluvial flooding is the result of a river exceeding its capacity and excess water spilling out onto the adjacent floodplain.

3.11.1 Catchment Flood Risk Assessment and Management Study (CFRAMS) Mapping

The CFRAMS is an OPW led national programme which seeks to identify and map potential existing and future flood hazard in areas at significant risk from flooding. It also aims to identify flood relief measures and prepare Flood Risk Management Plans for these areas.

The OPW has published detailed flood hazard mapping for the area based on results from the CFRAMS. This includes flood extent and flood depth mapping for several return periods for fluvial and coastal flood events. The CFRAMS assessment in this area is based on hydraulic modelling of the Corrib River and associated tributaries.

Figure 23 below shows an extract from the relevant CFRAMS fluvial flood map. The CFRAM mapping indicates that there is no fluvial flooding noted within the site and shows the site located outside of Flood Zones A or B, with the closest fluvial flooding area being approximately 2.7km east of the proposed site location.

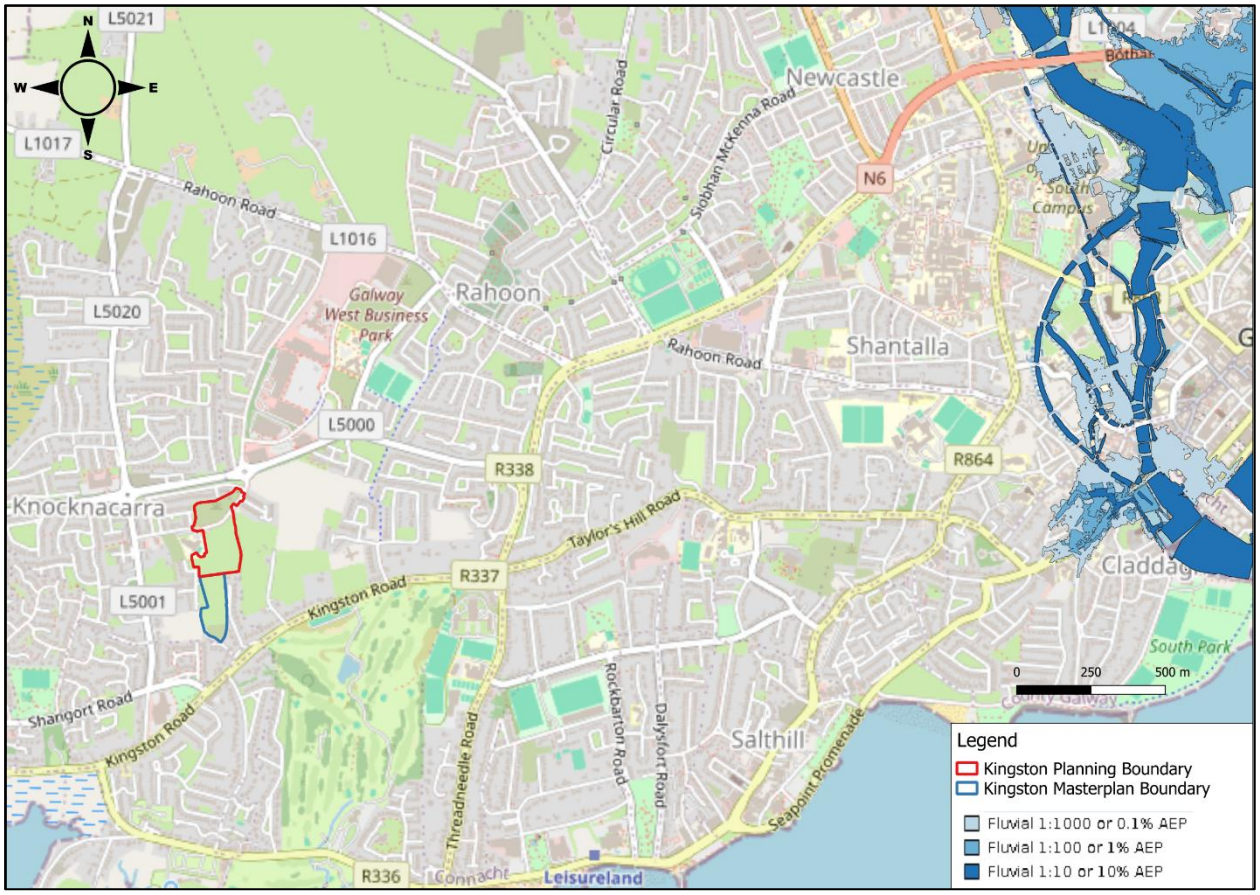


Figure 23: Extract from the CFRAMS fluvial map for the area (site indicated in red)
Maps available: http://www.floodinfo.ie/map/floodmaps/

3.12 Coastal Flooding

Coastal flooding results from sea levels which are higher than normal and result in sea water overflowing onto the land. Coastal flooding is influenced by the following three factors which often work in combination: high tide level, storm surges and wave action.

3.12.1 Catchment Flood Risk Assessment and Management Study

A review of the CFRAMS Coastal Flood Extent Mapping and the National Coastal Flood Hazard Mapping (NCFHM) indicates that the proposed site is not at risk of coastal flooding. The nearest projected flood zone is located approximately 1 km south of the site. This is illustrated in Figure 24, which presents an extract from the relevant CFRAMS coastal flood extent map.

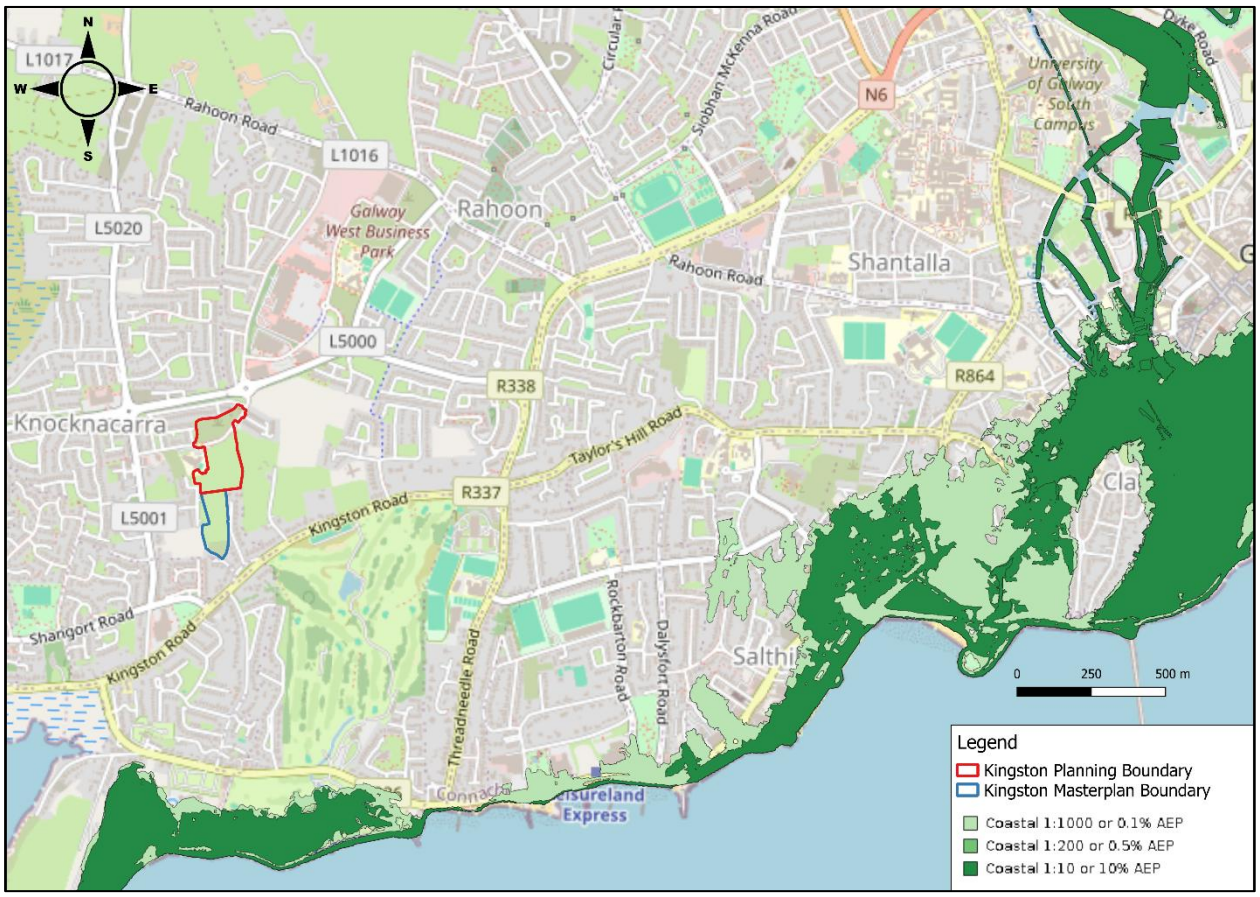


Figure 24: Extract from the CFRAMS Coastal Map for the Area (site indicated in red)

Maps available: http:// http://www.floodinfo.ie/map/floodmaps/

3.12.2 National Coastal Flood Hazard Mapping

The OPW published the National Coastal Flood Hazard Mapping (NCFHM) in 2021 and they are publicly available on https://www.floodinfo.ie/map/coastal_map/. The project produced updated national scale coastal flood extent and depth maps. These maps are 'predictive' flood maps showing indicative areas predicted to be inundated during a theoretical flood event with an estimated probability of occurrence. These flood maps do not take account of any existing flood defences.

Current Scenario NCFHM flood extents in the vicinity of the site can be seen below in Figure 25. The figure shows that the site is not subject to flooding during the 10%, 0.5% and 0.1% AEP events.

Figure 25: NCFHM Flood Extents – Current Scenario

3.13 Strategic Flood Risk Assessment

Strategic Flood Risk Assessment dated January 2022 and prepared by JBA Consulting as a part of the Galway City Development Plan 2023-2029 provides guidance for the integration of flood risk management into the development strategy for Galway City. In the report, CFRAM flooding maps are provided for Galway City as shown below in Figure 26. As per the Executive Summary, the SFRA acknowledges that '*The Flood Zones are based on an undefended scenario and do not take into account the presence of flood protection structures such as flood walls or embankments. This is to allow for the fact that there is a residual risk of flooding behind the defences due to overtopping or breach and that there may be no guarantee that the defences will be maintained in perpetuity*'. Hence, the flood extents shown are a worst-case scenario based on all flood defences in Galway not being operational and ignored entirely.

Based on the SFRA mapping, the site is located in Flood Zone C and is not at risk of flooding.

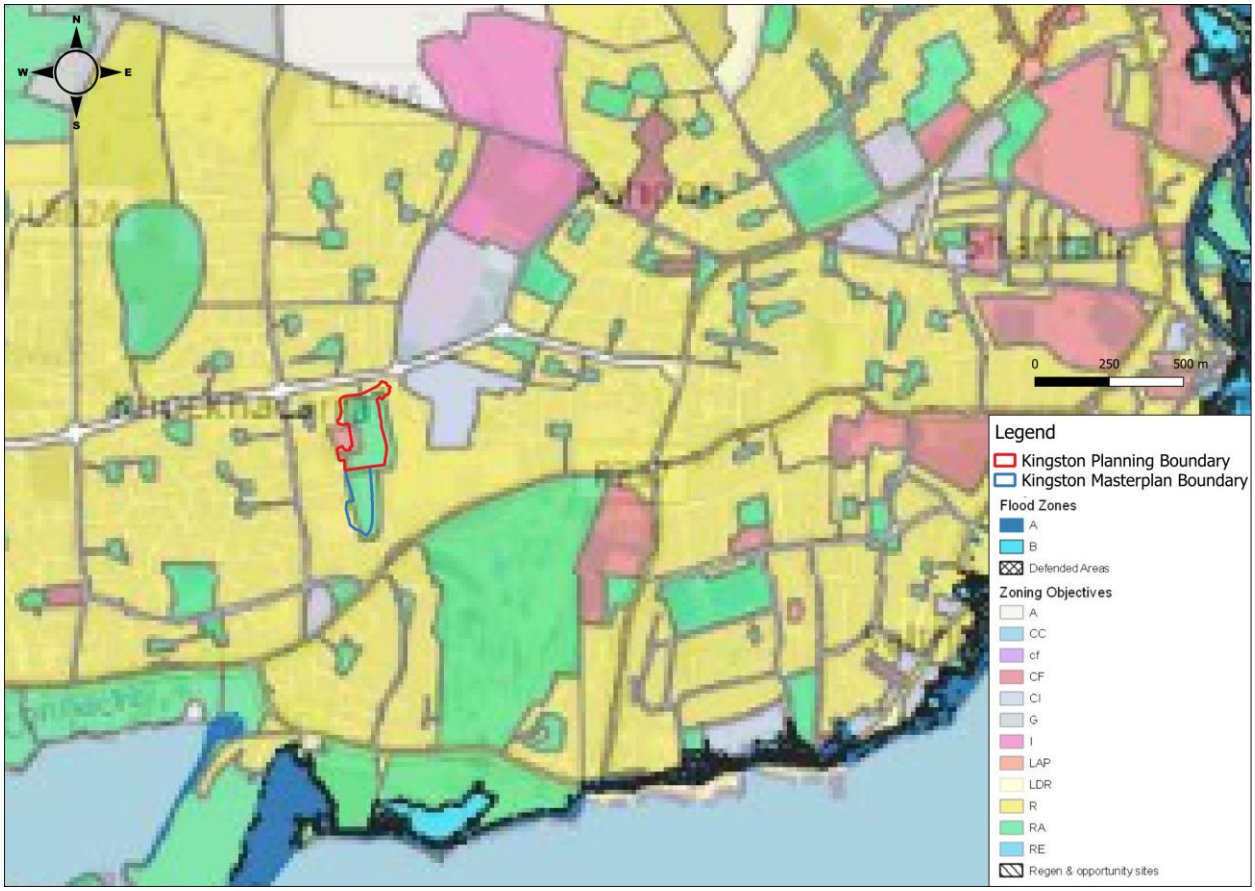


Figure 26: GCC CDP 2023-2029 Strategic Flood Risk Assessment

3.14 Arterial Drainage Scheme

A review of available flood risk datasets has not identified any flood defences in the vicinity of the site.

A review of the database indicates that the site is located outside the Arterial Drainage Scheme as shown in Figure 27 below. Arterial Drainage Schemes were carried out by the OPW to improve land for agriculture and to alleviate flooding. The OPW is tasked with maintaining these drainage works in proper repair and effective condition.

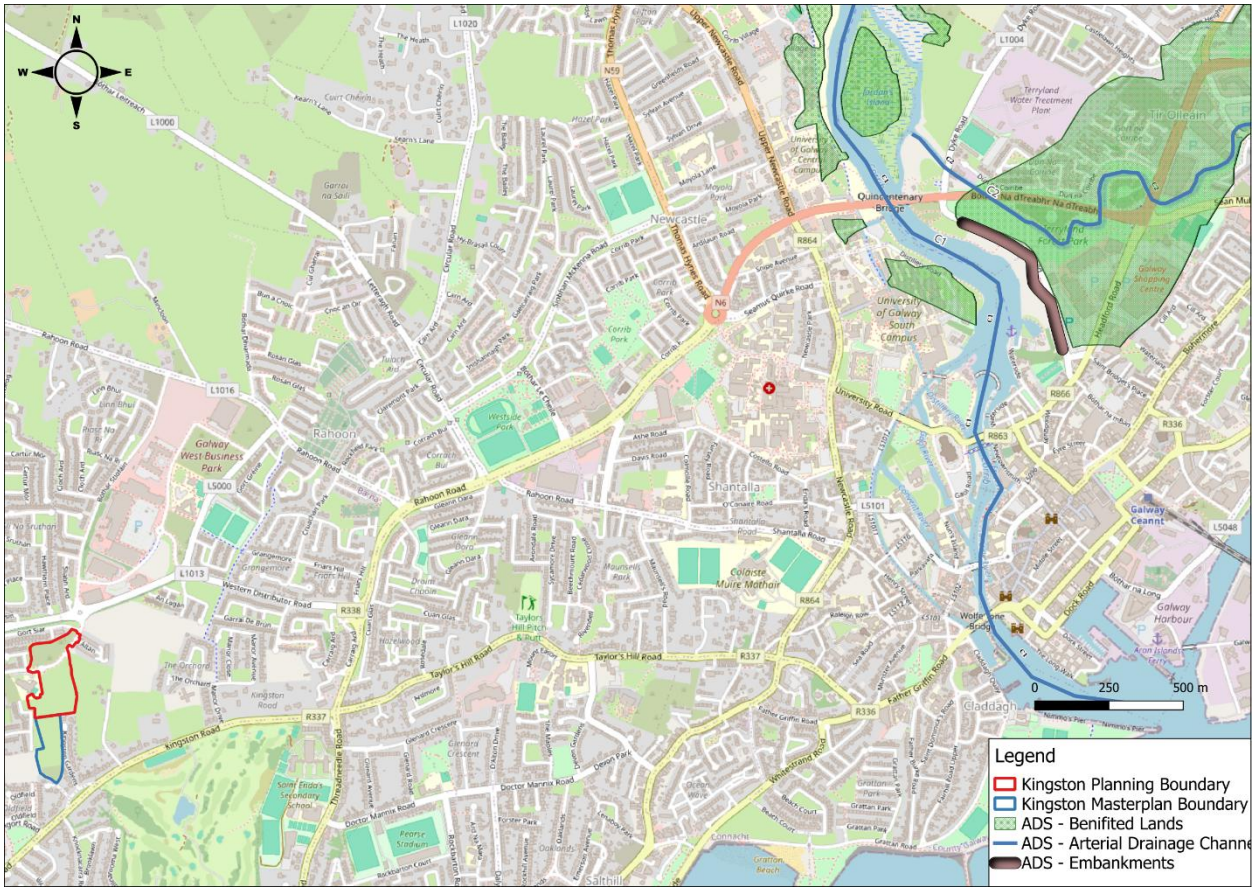


Figure 27: Extract from CFRAM Mapping indicating location of Arterial Drainage Scheme Channel (ref:floodinfo.ie)

3.15 Estimate of Flood Zone

PUNCH Consulting Engineers have reviewed the available information as outlined in the above sections and determined that the site is located in Flood Zone C and is therefore at low risk of flooding.

Flood Zone C was determined as per Section 2.23 of the Department of Housing, Local Government and Heritage Document 'Planning System and Flood Risk Management (DHPLG/OPW, 2009)'. Where Flood Zone C is defined as an area;

"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."

3.16 Sequential Approach

"The Planning System and Flood Risk Management" Guidelines published by the OPW set out a sequential approach to managing flood risk and to avoid development in areas that are at risk. A graphical representation of the Sequential Approach is included in the guidelines and is shown here as Figure 28.

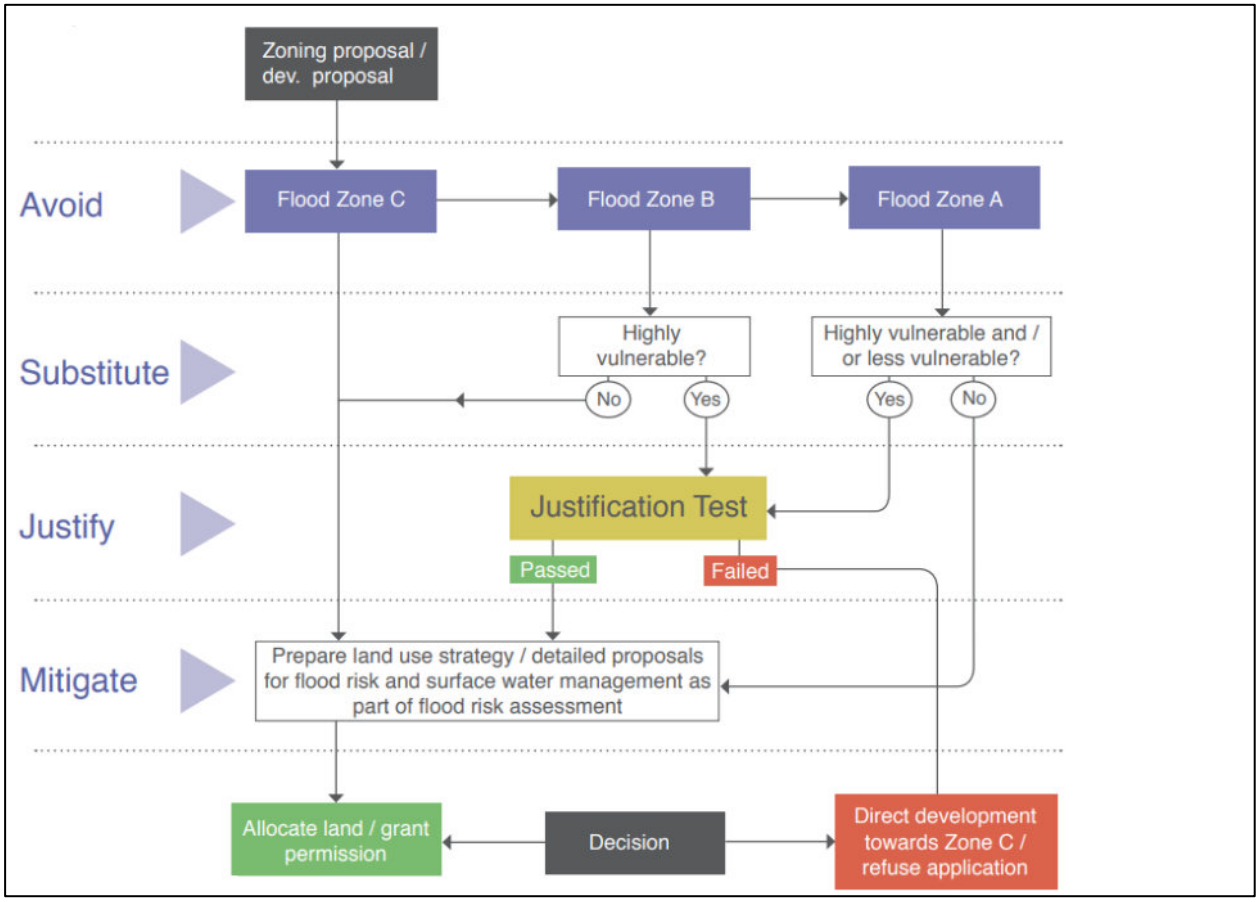


Figure 28: Graphical Representation of the Sequential Approach (The Planning System and Flood Risk Management" Guidelines 2009[1])

4 Conclusions

PUNCH Consulting Engineers were appointed by Galway City Council to carry out a Site-Specific Flood Risk Assessment for a proposed development at Millers Lane, Knocknacarra.

This Site-Specific Flood Risk Assessment has been carried out in accordance with *"The Planning System & Flood Risk Management Guidelines"* published by the Department of the Environment, Heritage and Local Government in November 2009 and the Galway City Council Development Plan.

Flood Maps produced as part of the CFRAMS were consulted to establish the Flood Zone. It was determined that the proposed development site is located in Flood Zone C.

The proposed development is at a low risk of flooding and is deemed appropriate provided the residual risk of pluvial flooding is addressed by a sufficiently sized surface water network.

[1] The Planning System and Flood Risk Management Guidelines 68fb690f-3c30-4649-a788-1b5129b3b610.pdf (www.gov.ie)

Appendix A Site Visit Images

Image 1 – View from middle of Kingston Park looking north to L10111

Image 2 -View from middle of the site looking north west to Knocknacarra NS

Image 3 – View from Middle of the site looking North east to eastern boundary of the site

Image 4 -View south from L10111

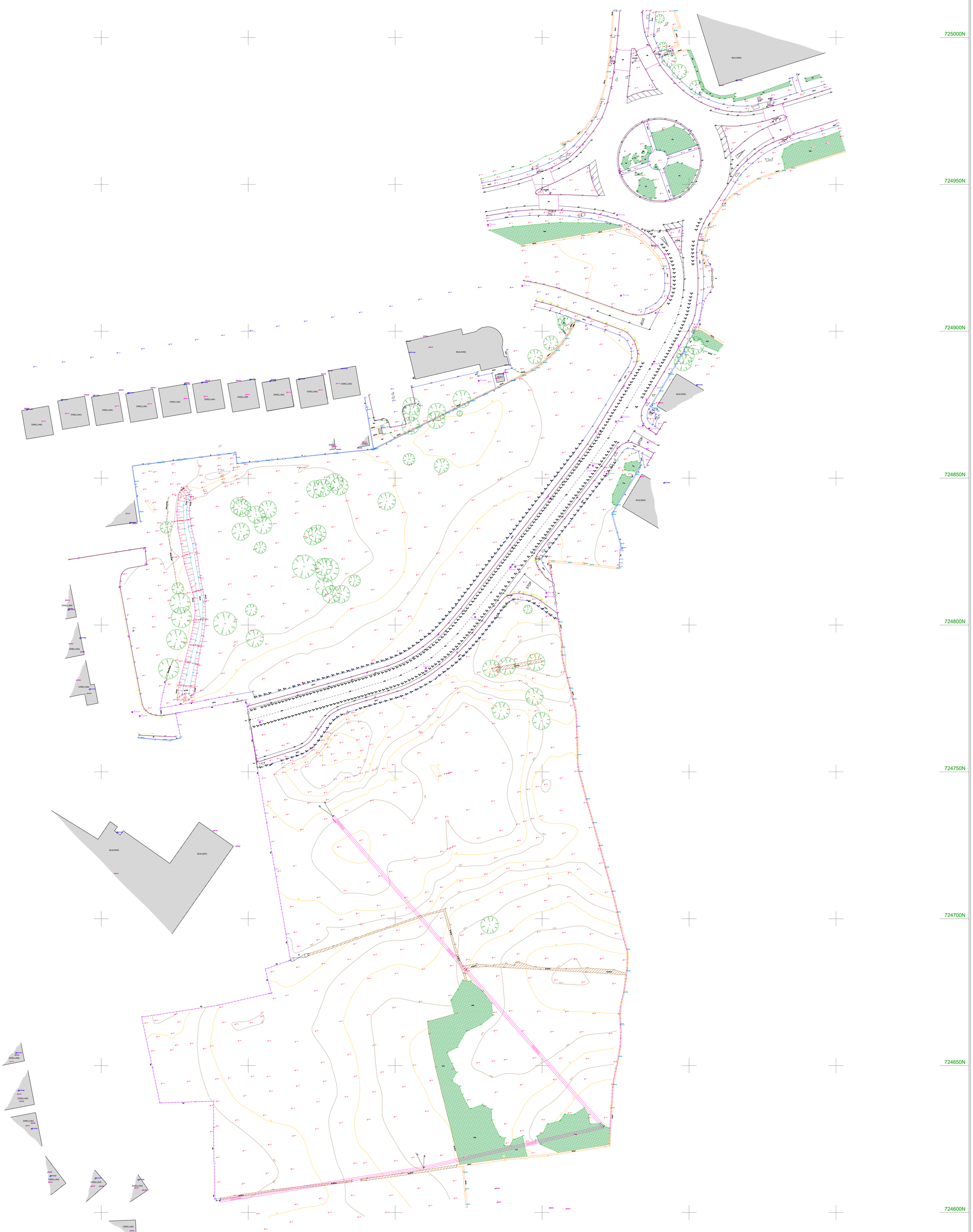
Image 5 – View west to part of site located north of L10111

Image 6 – View from Knocknacarra NS entrance looking east along L10111

Appendix B Topographical Survey

526300E 526350E 526400E 526450E 526500E 526550E 526600E

725050N 725000N 724950N 724900N 724850N 724800N 724750N 724700N 724650N 724600N 724550N



LEGEND

TOPO SURVEY:

- AV — AIR VALVE
- AJ — ARMSTRONG JUNCTION
- ESB — ESB MINI PILLAR
- EP — ESB POLE
- OHD PWR LINES — ELECTRICITY LINE OVER
- OHD TEL LINES — TELECOM LINE OVER
- FH — FIRE HYDRANT
- WM — WATER METER
- GATE — GATE
- RG — ROAD GULLY
- IC — INSPECTION CHAMBER
- LP — LAMP POST
- MH CL=10.61m — MANHOLE
- SP — SIGN POST
- SV — SLUICE VALVE
- SC — STOPCOCK
- Ncw1 / 100.00 — SURVEY STATION
- ICTE — TELECOM CHAMBER
- TP — TELECOM POLE
- LB — LIGHT BOLLARD
- TREES
- 225mmØ Approx. — COMBINED SEWER
- 225mmØ Approx. — FOUL SEWER
- 225mmØ Approx. — STORM SEWER

MEASURED BUILDING SURVEY:

- 2.00m — FLOOR TO CEILING HEIGHT DIMENSION
- FL=200.00m — FLOOR LEVEL - MALIN DATUM (Metres)
- FL=200.00m — FLOOR LEVEL - MALIN DATUM (Metres)
- FALL — ROOF FALL INDICATOR

NOTE:

01. Levels are in metres to OSGM15 (MALIN DATUM) unless otherwise noted. This datum was established using a Trimble Network Rover GPS system.
02. Co-ordinate system used - ITM95.
03. North refers to Grid North.
04. Only visible services have been surveyed.
05. Sewer TYPE, PIPE DIAMETER & FLOW direction have been estimated unless otherwise noted.
06. Building floor levels have been surveyed remotely and are approximate only, unless otherwise noted.
07. IF ANY DISCREPANCIES ARE FOUND IN THIS SURVEY, THEY SHOULD BE REPORTED TO NCWSURVEYS LTD IMMEDIATELY. FAILURE TO DO SO WILL INVALIDATE ANY SUBSEQUENT ISSUES ARISING FROM USING THIS SURVEY DATA.

REVISIONS

No.	Date	Staff	Description
----	----	----	----

Ncw SURVEYS
Wood Road,
Upper Grange,
Newcastlewest,
Co. Limerick.
Tel: +353(0)69-77820
Mob: +353(0)87-8702148
Email: Eamon@Ncwsurveys.ie

Client :	MKO Galway City and County Council
Scale:	1:500 (A0)
Project :	Survey of lands at Kingston Park, Galway City
Site crew :	PB+MM+COB+LS Date : Mar 2025
Drawn by :	DL+BM Date : Apr 2025
Checked by :	Date : Apr 2025
Description :	TOPO SURVEY
Drawing number :	25-022-003
Rev:	

TOPO SURVEY

0 5 10 15 20 30 40 50m

SCALE 1:500 (A0)

Appendix C Site Layout Plan

Registered Landscape Architect

FILE: C:\USERS\LAURA\ONEDRIVE - DAVE RYAN\SHARED DOCUMENTS - DRLA\02_PROJECTS\2024 PROJECTS\612_KINGSTONPARK\01 WORKING\02_PLANNING\P612-KIN.DWG PLOTTED: 17/10/2025 18:30 BY USER: LAURA

Outdoor classroom climate change and biodiversity lab

Sheltered and lockable long-term cycle storage. 20 x regular bays 2 x cargo / universal access bays

Earth mound serving as play feature, micro-climate wind moderation, outdoor classroom, hang-out space

Proposed Safe Route to School

Area with in-ground retractable power supply to accommodate live performances

Pedestrian plaza in front of main access to building, with pleached trees, outdoor seating to cafe

Smoking shed

Universally Accessible access control arrangement at entrance to proposed park and intersection with 'Safe Route to School'

Circular seat surrounding raised planter with tree

Proposed new pedestrian entrance gate to school

Proposed new vehicular entrance gate to school

Parks Department Staff Kiosk

Parks Department Storage

Storage enclosure for mobile Cricket Batting Cage

Main Avenue primary access through park - 5m wide to accommodate cycle and pedestrian flows

Habitat corridor consisting of native hedgerow and short flowering wildflower meadow to western park perimeter

Boules pitch

Habitat corridor consisting of native hedgerow, Woodland, Long flowering meadow, and short flowering wildflower meadow to western park perimeter

Greenway route through park with 24-hour access to connect to existing cycle network

Calisthenics equipment area

Multi-functional gaming area with enclosing bench retaining wall seating

Informal games lawn

Habitat corridor to western park perimeter

Wayfinding fingerpost sign

Universally Accessible access control arrangement at entrance to 'Safe Route to School'

Park Entrance Gateway Totem / Vehicular Barrier

Refuse collection pad

Wayfinding map sign

Modification of Road Alignment Approved Under Permitted Aquatic Centre Development (Pln. Ref. 24/60370).

Pedestrian area in front of doors to external changing rooms

Proposed dismount track to active travel route at entry point to park grounds

Wayfinding map sign

Refuse storage enclosure

Proposed sports equipment store

Secondary pedestrian circulation

Habitat corridor consisting of native hedgerow and short flowering wildflower meadow to western park perimeter

Pedestrian connection to proposed *Kingston Stables* Large-Scale Residential Development to the east of Kingston Park (Pln. Ref. XX/XXXX).

Play area to detail design by specialists. Refer to Schedule of Affordances for detailed requirements.

Habitat corridor consisting of native hedgerow, Woodland, Long flowering meadow, and short flowering wildflower meadow to western park perimeter

Multi-functional building that can cater for sports and other activities

4G synthetic pitch for IRFU rugby, GAA rounders and mobile cricket batting cage use with perimeter fencing

Master planned area to be brought forward as part of future application

Legend

Site Boundary

CIRCULATION & SURFACES

Public Building Entrance (Primary/ Secondary)

Pedestrian Site Entrance (Primary/ Secondary)

Active Travel Site Entrance (Primary/ Secondary)

Vehicular Site Entrance

S1 - Motorised Traffic including coaches
Refer to Engineer's for Specification

S2 - Parking Bays
Permeable surface to SuDS specification
Materials TBC

S3 - Plaza & Main Avenue
In-situ concrete surfacing with exposed aggregate finish comprising a mix of locally sourced granite and limestone aggregate (6–10 mm). Surface to be acid-etched or washed to expose aggregate.

S4 - Multi-Use Gaming Areas
Seamless poured rubber with integrated line markings and zones in varied colour mix (exact colours by detailed design).

S5 - Cycleway
Stone Mastic Asphalt (SMA) 6mm grade finish with clear polymer modified binder, 'Terracotta' colour pigment and colour-matched aggregates

S6 - Soft-Pour Rubber Safety Surfacing
Seamless poured rubber surface with certified impact attenuation for playground use. Colour and pattern to be confirmed at detailed design stage. Installed to critical fall height requirements in accordance with EN 1177.

S7 - Certified Play Sand
Clean, washed, fine-grain silica sand for use in sand play features and loose material play. Not intended for impact attenuation. Install over free-draining base t specified depth with suitable edging to contain material.

S8 - Self-binding Gravel
Compacted, permeable gravel with fines for firm, stable finish. Laid to max gradient of 1:12 (8%) Requires edge restraint.

S9 - Pedestrian paths
Stone Mastic Asphalt (SMA) 6mm grade finish with clear polymer modified binder, 'Light Buff' colour pigment and colour-matched aggregates

S10 - Artificial Grass Playing Surface
To Pitch Consultant Specification

PLANTING

T1 - Large-Scale Standard Trees
Ultimate height 20 m+, canopy spread 15 m+. Structural native trees suitable for large open spaces, parks, and woodland frameworks, e.g. Quercus robur, Pinus sylvestris

T2 – Moderate-Scale Standard Trees
Ultimate height 10–20 m, canopy spread 8–15 m. For spatial definition, greenways, buffer planting, and woodland edge e.g. Betula pendula, Alnus glutinosa

T3 – Multistem Trees
Ultimate height 3-3.5 m, canopy spread 8-15m. For, buffer planting, open green spaces, and woodland edge e.g. Betula Jaquemontii, Alnus glutinosa, Amelanchier

T4 – Pleached Trees
Ultimate height 3-3.5 m, canopy spread 1 x 3 m.
For spatial definition and micro-climatic comfort at entrance plaza

T5 – Bioretention Tree Pit with filter / liner at 1m depth
Ultimate height 10–20 m, canopy spread 8–15 m. For spatial definition, greenways, buffer planting, and woodland edge e.g. Betula pendula, Alnus glutinosa

PL1 - Native Woodland Planting
Mixed native trees and understorey for biodiversity, screening, and long-term canopy development. Naturalistic layout.

PL2 – Biodiversity-Friendly Shrub Planting
Mixed flowering shrubs and subshrubs for year-round nectar and structure. Species selection to support biodiversity.

PL3 – Pollinator-Friendly Perennials & Shrubs Mix
Matrix planting of herbaceous perennials, sub-shrubs and ornamental grasses. Designed for texture, pollinators, and seasonal colour.

PL4 – Raingarden Mix
Matrix planting of herbaceous perennials, sub-shrubs and ornamental grasses. Designed for texture, pollinators, and seasonal colour and to tolerate occassional inundation and drought

PL5 – Long Wildflower Meadow
Medium height grass meadow mix, 2 to 3 cus annually, for large meadow areas to provide habitat biodiversity

PL6 – Short-flowering Meadow
Short height grass meadow mix, cut every 6 weeks from April for path edges to provide habitat biodiversity

PL7 – Riparian/ Wetland Meadow
large Riparian/ wetland meadow areas to provide habitat biodiversity

PL8 – Amenity Sports Turf
Hard-wearing grass mix for informal kickabout and lawn areas

PL9 – Native Hedge
Mixed Native hedge

BOUNDARIES & WAYFINDING

B1 – Low wall
Finish TBD

B2 – Active travel barrier
Stone wall, exact finish and positioning TBD

B2 – Rugby Pitch Boundary Fence/ Spectator leaning post
Boundary treatment finish and exact positioning TBD

B2 – Restricted access perimeter fencing
Boundary treatment finish and exact positioning TBD, include for matching gate

Bird Box
Approximate location of proposed bird boxes to support ecology. Bird boxes to be secured to trees using strap, minimum 2m above ground level, facing north to south-east.

Bat Box
Approximate location of proposed bat boxes to support ecology. Bat boxes to ecologist's specification.

Biodiversity support and outdoor classroom
B Bee post
T Thermometer for Outdoor Classroom Climate Lab
W Wind vanes for Outdoor Classroom Climate Lab
R Rain gauge for Outdoor Classroom Climate Lab
S Sun dial for Outdoor Classroom Climate Lab

Wayfinding & Biodiversity Education
M Location Map
i Information panel
K Blackboard
P Plant / Tree identification plate
H Bug hotel
F Fingerpost
T Totem Gateway

N
W E
Winter Summer
S

0 meters 25 50 75

.	.	.	.	.
Issue/Rev. no.	Description	Date	Sign	Chk'd

2025-10-17 Draft for Pre-Planning Review

Client: **Galway City Council**
Project: Outdoor Recreation Facilities in Galway City West
Drg Title: Site Layout Plan
Stage: Planning
Drg. No.: P612-KIN-LD-GA-101
Scale: 1:500 @ A0
Date: 17th October 2025
Drawn By:LF Checked by: DR

DRLA LANDSCAPE ARCHITECTS
12 Barrington Street
Limerick, V94 XA4W
www.DRLA.ie
Tel.: 061 59 00 01
Email: info@DRLA.ie

Note: No scaled measurements to be taken from this drawing, written dimensions only.
Scales are indicative only and can vary with different printing and photocopying methods.
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Further specification, measurements and levels can be provided at Tender or Construction phases as required by the client.