Planning and Environmental Consultants

Natura Impact Statement

Strategic Housing Development, Knocknacarra District Centre, Gort na Bró, Rahoon, Galway

DOCUMENT DETAILS

Client:	**Glenveagh Living**
Project Title:	**Strategic Housing Development, Knocknacarra District Centre, Gort na Bró, Rahoon, Galway**
Project Number:	**180531**
Document Title:	***Natura Impact Statement***
Document File Name:	***NIS F 2019.05.02- 180531***
Prepared By:	**MKO** **Tuam Road** **Galway** **Ireland** **H91 VW84**

Planning and Environmental Consultants

Rev	Status	Date	Author(s)	Approved By
01	Draft	02/05/2019	JOS/DMN	PR
02	Final	29/05/2019	JOS/DMN	PR

Table of Contents

1. INTRODUCTION

1.1 Background

McCarthy Keville O'Sullivan Ltd. (MKO) has been appointed to provide the information necessary to allow the competent authority to conduct an Article 6(3) Appropriate Assessment for proposed strategic housing development at Gort na mBro, Rahoon, Knocknacarra, Galway.

The current project is not directly connected with, or necessary for, the management of any European Site, consequently the project has been subject to the Appropriate Assessment process. This Natura Impact Statement has been provided on a voluntary basis.

The assessment in this report is based on a desk study and field surveys undertaken in April 2019. It specifically assesses the potential for the proposed development to result in adverse effects on European sites.

This report has been prepared in accordance with the European Commission guidance document *Assessment of Plans and Projects Significantly Affecting Natura 2000 Sites: Methodological Guidance on the provisions of Article 6(3) and 6(4) of the Habitats Directive 92/43/EEC* (EC, 2001) and the Department of the Environment's Guidance on the Appropriate Assessment of Plans and Projects in Ireland (December 2009, amended February 2010).

In addition to the guidelines referenced above, the following relevant guidance was considered in preparation of this report:

1. *DoEHLG (2010) Appropriate Assessment of Plans and Projects in Ireland Guidance for Planning Authorities. Department of the Environment, Heritage and Local Government,*
2. *European Communities (2000) Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC, Office for Official Publications of the European Communities, Luxembourg. European Commission,*
3. *European Communities (2018) Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC, Office for Official Publications of the European Communities, Luxembourg. European Commission,*
4. *Directive 92/43/EEC, Office for Official Publications of the European Communities, Luxembourg. European Commission,*
5. *EC (2007) Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC – Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence, opinion of the commission. European Commission,*
6. *EC (2013) Interpretation Manual of European Union Habitats. Version EUR 28. European Commission,*
7. *NRA (2009) Guidelines for Assessment of Ecological Impacts of National Roads Schemes, National Roads Authority, Dublin.*

1.2 Background to Appropriate Assessment

1.2.1 Screening for Appropriate Assessment

Screening is the process of determining whether or not an Appropriate Assessment is required for a plan or project. A Screening must be carried out by the Competent Authority to assess, in view of best scientific knowledge, if a land use plan or proposed development, individually or in combination with another plan or project, is likely to have a significant effect on a European site. The Competent Authority's determination as to whether or not an Appropriate Assessment is required must be made on the basis of objective information and should be recorded. The Competent Authority may request information to be supplied to enable it to carry out screening.

Where it cannot be excluded beyond reasonable scientific doubt, that a proposed plan or project, individually or in combination with other plans and projects, would have a significant effect on the conservation objectives of a European site, an Appropriate Assessment (Natura Impact Statement (NIS)) of the plan or project is required.

1.2.2 Appropriate Assessment (Natura Impact Statement)

A Natura Impact Statement (NIS), where required, should present the data, information and analysis necessary to reach a definitive determination as to 1) the implications of the plan or project, alone or in combination with other plans and projects, for a European site in view of its conservation objectives, and 2) whether there will be adverse effects on the integrity of a European site. The NIS should be underpinned by best scientific knowledge, objective information and by the precautionary principle.

1.2.3 Statement of Authority

Field surveys were undertaken on the 22nd March 2019 and 23rd September 2019 by James Owens (B.Sc., M.Sc). James is an experienced ecologist with over 4 years professional ecological consultancy experience. Additional ecological surveys were undertaken by David McNicholas (B.Sc., M.Sc., MCIEEM) on the 29th of April 2019. David is a full member of the Chartered Institute of Ecology and Environmental Management (MCIEEM) and has over 8 years professional ecological consultancy experience. This report has been prepared by Julie O'Sullivan (B.Sc., M.Sc.) and David McNicholas. Julie has over 5 years professional ecological experience. This report has been reviewed by Pat Roberts (B.Sc. Environmental Science, MCIEEM) who has over 14 years' experience in management and ecological assessment.

2. DESCRIPTION OF THE PROPOSED WORKS

2.1 Site Location

The proposed site is located on Gort na Bró, Rahoon, Knocknacarra, Galway approximately 3.1km west of Galway City Centre (Grid Reference: M 26809 25134). The surrounding area is characterised by the established residential suburb of Knocknacarra. The lands adjoining the site to the west are the location of the Gateway Retail Park.

The application site is bounded by Gort na Bró to the east and the retail park link road to the west. The Western Distributor Road, an arterial route serving the city, is located to the south. The proposed site has an area of approximately 1.9 ha. The site location is shown in Figure 2.1.

2.2 Characteristics of Proposed Works

2.2.1 General Project Description

Glenveagh Living Limited, intend to apply to An Bord Pleanála for planning permission for a strategic Housing Development at Gort na Bró, Rahoon, Galway. The development will consist of:

1. Construction of 332 no. residential units:
    - 93 no. 1 bed apartments
    - 219 no. 2 bed apartments
    - 20 no. 3 bed apartments

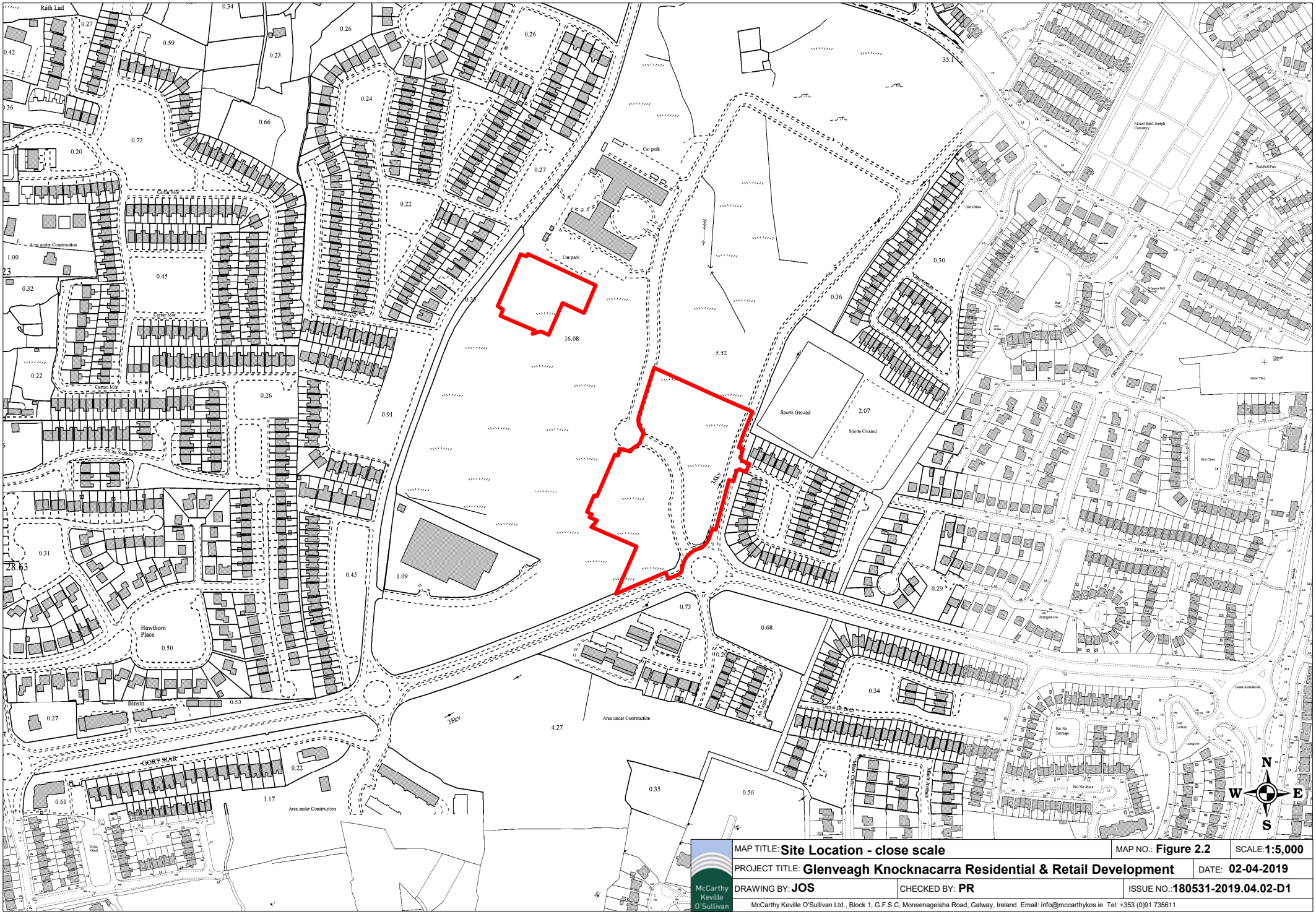
2. Provision of 2,667 sq.m of commercial floorspace
3. Provision of 93 sq.m of community use facilities
4. Provision of 470 sq.m of tenant amenity accommodation including shared workspaces, shared dining and lounge facilities
5. Provision of 174sq.m creche facility including an external secure play area.
6. Provision of 85 no. car parking spaces and provision of realigned road between Gort na Bró and Gateway Retail Park Road.
7. Change of use of underground void to 181 bay underground car park.
8. Provision of shared communal and private open space, car parking, bicycle parking, bin storage, public lighting, site landscaping, services, signage, substation and all associated site development works.

The proposed site layout is shown in Figures 2.2 and 2.3.

MAP TITLE: **Site Location**		MAP NO.: **Figure 2.1**	SCALE: **1:25,000**
PROJECT TITLE: **Glenveagh Knocknacarra Residential & Retail Development**			DATE: **02-04-2019**
DRAWING BY: **JOS**	CHECKED BY: **PR**		ISSUE NO.: **180531-2019.04.02-D1**

McCarthy Keville O'Sullivan

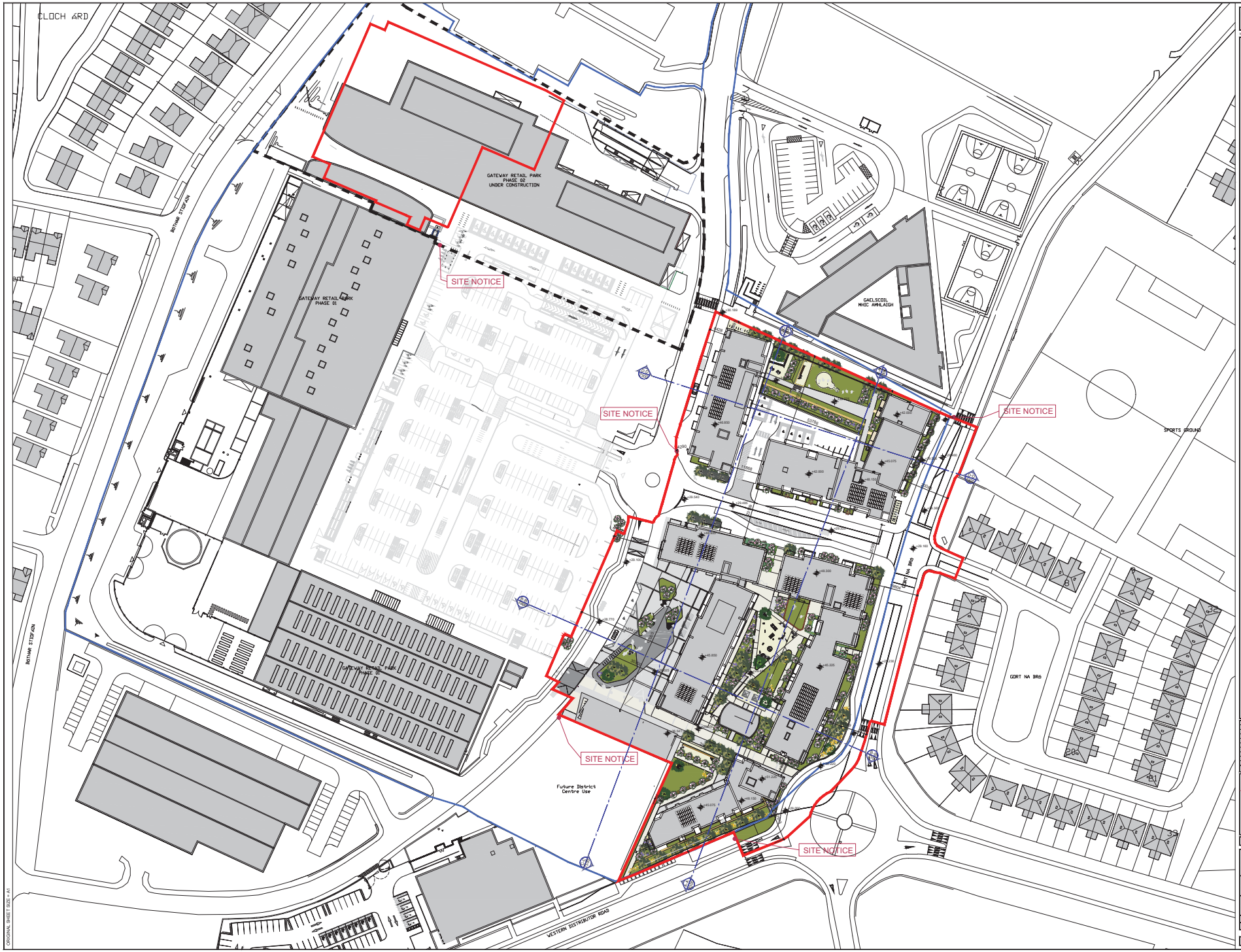
McCarthy Keville O'Sullivan Ltd., Block 1, G.F.S.C, Moneenageisha Road, Galway, Ireland. Email: info@mccarthykos.ie Tel: +353 (0)91 735611



MAP TITLE: **Site Location - close scale**		MAP NO.: **Figure 2.2**	SCALE: **1:5,000**
PROJECT TITLE: **Glenveagh Knocknacarra Residential & Retail Development**			DATE: **02-04-2019**
DRAWING BY: **JOS**	CHECKED BY: **PR**		ISSUE NO.: **180531-2019.04.02-D1**

McCarthy Keville O'Sullivan

McCarthy Keville O'Sullivan Ltd., Block 1, G.F.S.C, Moneenageisha Road, Galway, Ireland. Email: info@mccarthykos.ie Tel: +353 (0)91 735611



DO NOT SCALE FROM THIS DRAWING. USE FIGURED DIMENSIONS IN ALL CASES. VERIFY DIMENSIONS ON SITE AND REPORT ANY DISCREPANCIES TO THE ARCHITECTS IMMEDIATELY. THIS DRAWING TO BE READ IN CONJUNCTION WITH THE ARCHITECTS SPECIFICATION. © THIS DRAWING IS COPYRIGHT AND MAY ONLY BE REPRODUCED WITH THE ARCHITECTS PERMISSION.

NOTES

ALL LEVELS ARE GIVEN IN METRES AND ARE REFERRED TO O.S. DATUM MALIN HEAD CO. DONEGAL (1975 ADJUSTMENT)

NORTH

KEY

- SITE OF PLANNING APPLICATION OUTLINED IN RED 3.00 Ha
- GATEWAY RETAIL PARK PHASE 02 - PLANNING REF. 17/158 UNDER CONSTRUCTION

Figure 2.3

Glenveagh Living

REV	DTE	DRN	ISSUE
A	OCT 2020	DM	ISSUED IN APPLICATION

architecture+urbanism

FOR PLANNING

JOB
KNOCKNACARRA DISTRICT CENTRE, RAHOON, GALWAY

CLIENT
GLENVEAGH LIVING

DRAWING
PROPOSED SITE PLAN

DATE	OCT 2020	SCALE	1:500@ A0
DRN.	C.MORGAN	CHECKED	M.FREANEY

JOB NO.	DWG NO.	REVISION
18-179	18-179_1011	A

ORIGINAL SHEET SIZE: A1

2.2.2 Drainage

A detailed engineering '*Infrastructure Design Report'* (DBFL, 2019)[1] is provided as part of the planning application submission documentation. The following summary of the proposed site drainage infrastructure is based on the detailed descriptions provided in the *'Infrastructure Design Report'.*

2.2.2.1 Foul Sewer Network

As described in the *Infrastructure Design Report* (DBFL, 2019), it is proposed to divert the existing foul water sewers within the site to align the drainage layout with the proposed diversion of the existing access road to the Gateway Retail Park, as shown on drawing 180191-3000, Appendix 4 of this report.

The proposed development will be provided with a foul drainage network to collect foul flows from the apartment blocks and commercial units. The foul drainage system will connect with the existing 225mm diameter sewers to the north-west and south west of the site.

Car parking incidental drainage at ground floor level will gravitate to the lowest point before passing through an interceptor, where this will discharge to the foul network, as shown on drawing 180191-3000, Appendix 4. Sewers are designed in accordance with the Building Regulations and Irish Water's Code of Practice for wastewater infrastructure and Standard Details for wastewater infrastructure.

An Irish Water Pre-Connection Enquiry form has been submitted to Irish Water and an Irish Water Feedback form has been received outlining that wastewater is connecting to the public sewer system, that has the capacity and capability to deal with it. This is provided in Appendix 3 of this report

2.2.2.2 Surface Water Drainage

As outlined in the *Infrastructure Design Report* (DBFL Consulting Engineers, 2019), it is proposed to divert the existing surface water sewers within the site to align the drainage layout with the proposed diversion of the existing access road to the Gateway Retail Park as represented on drawing 180191-3000, Appendix 4 of the Infrastructure Design Report (DBFL Consulting Engineers, 2019),

The proposed development site will be provided with a surface water drainage network to collect surface water flows from the apartment blocks and commercial units as shown in Drawing 180191-3000 '*Site services layout*'. Drawing 180191-3000 also shows the location of the existing surface water network and the proposed stormwater drainage discharge point. As the existing stormwater sewer forms part of watercourse IE_WE_31K160960 (EPA reference number -see EPA online map viewer), storm water runoff ultimately discharges to Galway Bay via Rusheen Bay. In order to protect surface water quality in the receiving environment, all water discharged from the site will be at attenuated greenfield run-off rates to the existing sewer, located to the north-west and south-west of the site and will include for the installation of a Class 1 Bypass Separators at the outfall from each network. This will ensure that there is no release of hydrocarbons associated with the proposed project.

The surface water strategy incorporates attenuation of storm water to limit discharge from the site, although storage facilities and SUDs elements will be designed to allow infiltration or reduction of run-off volumes and rates where possible.

As outlined in the Infrastructure Design Report (DBFL Consulting Engineers, 2019), all run-off from roofs and areas of hardstanding will be conveyed to the surface water drainage network at ground floor level. Sustainable urban drainage system (SUDS) elements will be incorporated in to the design and will include the following:

[1] *DBFL Consulting Engineers, 2019, Infrastructure Design Report, Report Reference: 180191-Rep-001*

- Porous asphalt paving on part of civic plaza to provide treatment, storage and reduce run-off rates.
- Green podium with landscaped areas and raised planters to reduce run-off rates and total impermeable area.
- Two off-line attenuation storage systems for the attenuation of flood water up to the 100 year storm event + 10% allowance for climate change.
- A Class 1 Bypass Separators to be provided on the outfall from each network.
- Surface water run-off from the overall development will be attenuated to greenfield runoff rates.
- To prevent pollutants or sediments discharging into water courses, interception storage will receive the run-off for rainfall depths of 5mm up to 10mm. The SUDS features include porous asphalt and landscaped podium will provide the necessary interception volume.

2.2.2.3 Flooding

A Site-Specific Flood Risk Assessment (SSFRA) has been prepared for the proposal (DBFL Consulting Engineers, 2019). This report determined that the Site is within Flood Zone C and concluded that the residential development proposed is appropriate for the Site's flood zone category.

The assessment found that the development has a good level of flood protection up to the 100-year return event. For pluvial floods exceeding the 100-year capacity of the drainage system then the proposed flood routing mitigation measures should protect the areas with lower finish floor levels by directing flood water to the drainage outfall.

2.2.3 Construction Best Practice Measures

A *Preliminary Construction Management Plan* has been prepared for the proposed development (DBFL Consulting Engineers, 2019) and is included in Appendix 1 of this report. The report outlines the following construction best practice measures to be implemented:

Site Set Up

The site will be secured with hoarding on all sides.

Earthworks

Earthworks will consist of reducing existing levels for the proposed sub-structure, foundations and services. The extent of earthworks will be minimal as no basement structures are proposed. Excess material and peat will be disposed offsite to a suitably licensed facility.

Pollution Control

- Drainage systems/groundwater will be protected from sedimentation and erosion due to direct surface water runoff generated onsite during the construction phase. Surface water discharge from site will be managed and controlled for the duration of the construction works until the permanent surface water drainage system of the proposed site is complete. A temporary drainage system shall be installed prior to the commencement of the construction works to collect surface water runoff by the site during construction.
- Accidental Spills and Leaks – All oils, fuels, paints and other chemicals will be stored in a secure bunded construction hardstand area. Refueling and servicing of construction machinery will take place in a designated hardstand area which is also remote from any drainage systems. A response procedure will be put in place to deal with any accidental

pollution events and spillage kits will be available and construction staff will be familiar with the emergency procedures and use of the equipment.

- Concrete – Concrete batching will take place off site, wash down and wash out of concrete trucks will take place off site and any excess concrete is not to be disposed of on site. Pumped concrete will be monitored to ensure there is no accidental discharge. Mixer washings are not to be discharged into surface water drains.
- Disposal of Wastewater from Site – Discharge from any vehicle wheel wash areas is to be directed to on-site settlement tanks/ponds, debris and sediment captured by vehicle wheel washes are to be disposed off-site at a licensed facility.
- Foul drainage discharge from the construction compound will be tankered off site to a licensed facility until a connection to the public foul drainage network has been established.

Waste Management

During the construction of the proposed infrastructure works, any unsuitable material or unusable material will be disposed offsite to a suitably licensed landfill facility in accordance with the regulations for same and the project Construction Waste Management Plan.

Environmental Monitoring

The contractor will assign a member of the site staff as the environmental officer with the responsibility for ensuring the environmental measures prescribed in this document are adhered to. Any environmental incidents or non-compliance issues will immediately be reported to the project team.

2.2.4 Invasive Species

The introduction and/or spread of invasive species could result in the establishment of invasive alien species and this may have negative impacts on the surrounding environs. Appropriate spread prevention measures have been incorporated into the design of the project.

General Control measures for the management of Invasive Species

The following measures address potential impacts associated with the construction phase of the project:

- Good construction site hygiene will be employed to prevent the introduction and spread of problematic invasive alien plant species by thoroughly washing vehicles prior to entering and leaving the site.

The treatment and control of invasive alien species will follow guidelines issued by the National Roads Authority – *The Management of Noxious Weeds and Non-native Invasive Plant Species on National Roads* (NRA 2010).

3. CHARACTERISTICS OF THE RECEIVING ENVIRONMENT

Assessing the impacts of any project and associated activities requires an understanding of the ecological baseline conditions prior to and at the time of the project proceeding. Ecological baseline conditions are those existing in the absence of proposed activities (CIEEM, 2018).

A multidisciplinary walkover surveys were conducted in line with NRA (2009) guidelines *(Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes*). Field surveys were undertaken on the 22nd March 2019 and 23rd September 2019 by James Owens (B.Sc., M.Sc). Additional ecological surveys were undertaken by David McNicholas (B.Sc., M.Sc., MCIEEM) on the 29th of April 2019. All habitats within and adjacent to the works area were readily identifiable during the site visit. A habitat map is provided as Figure 3.1, and a habitat with the development overlain is provided as Figure 3.1a.

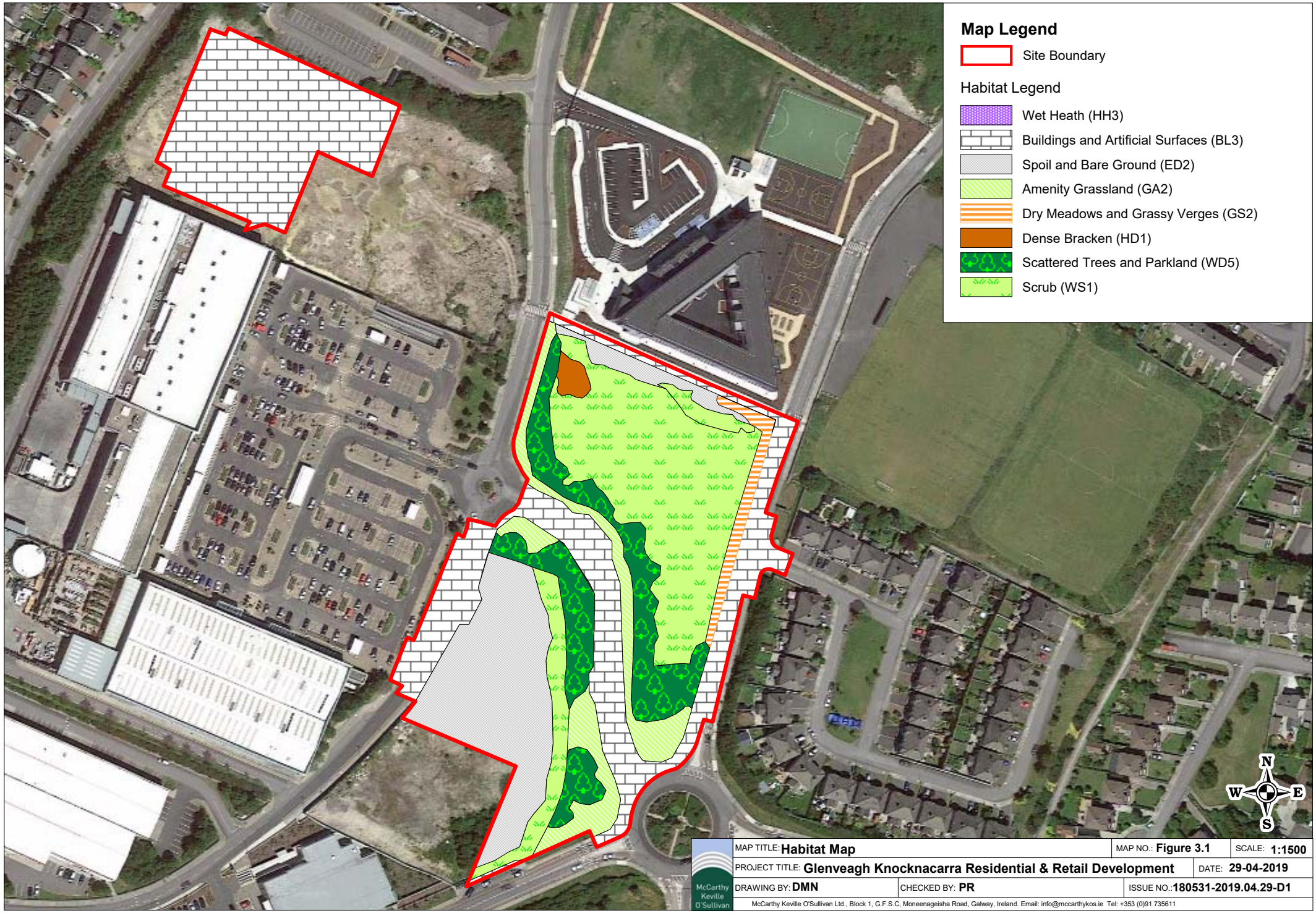
The northern half of the site is primarily *Scrub (WS1)* habitat, dominated by gorse (*Ulex europeaus*), dense bramble (*Rubus fruticosus agg.)* and nettle (*Urtica dioica*) (Plate 3.1). A stand of *Dense bracken (HD1)* (*Pteridium aquilinum*) occurs to the north west of the site. The southern half of the site is dominated by an area of *Spoil and bare ground (ED2)* which is currently used as a construction compound (Plate 3.2). The site is bisected by a public access road into the Gateway Retail Park. The road and surrounding footpaths are categorised as *Buildings and artificial surfaces (BL3).*

Either side of the public road are small areas of *Amenity Grassland (GA2)* and *Scattered trees and parkland (WD5)* (Plate 3.3). The *Scattered trees and parkland (WD5)* habitat has been planted for landscaping sometime within the past twenty years and consisted of clusters of semi-mature and immature trees which included beech (*Fagus sylvestris*), ash (*Fraxinus excelsior*), maple (*Acer* sp.), birch (*Betula* sp.) and hawthorn (*Crataegus monogyna*).

A narrow strip of *Dry Meadows and Grassy Verges (GS2)/ recolonising bare ground (ED3)* fringes the scrub habitats to the north and west of the site. The site is immediately bordered by roads and other buildings which are all categorised as *Buildings and artificial surfaces (BL3)* (see Plate 3.4). No watercourses were recorded within or adjacent to the proposed development site.

An existing built structure, located to the northwest of the proposed development site, has been incorporated into the proposed development boundary as the application includes this premises as a '*change of use of underground void to 183 bay underground car park'*. This existing building has been identified as *Buildings and artificial surfaces (BL3).*

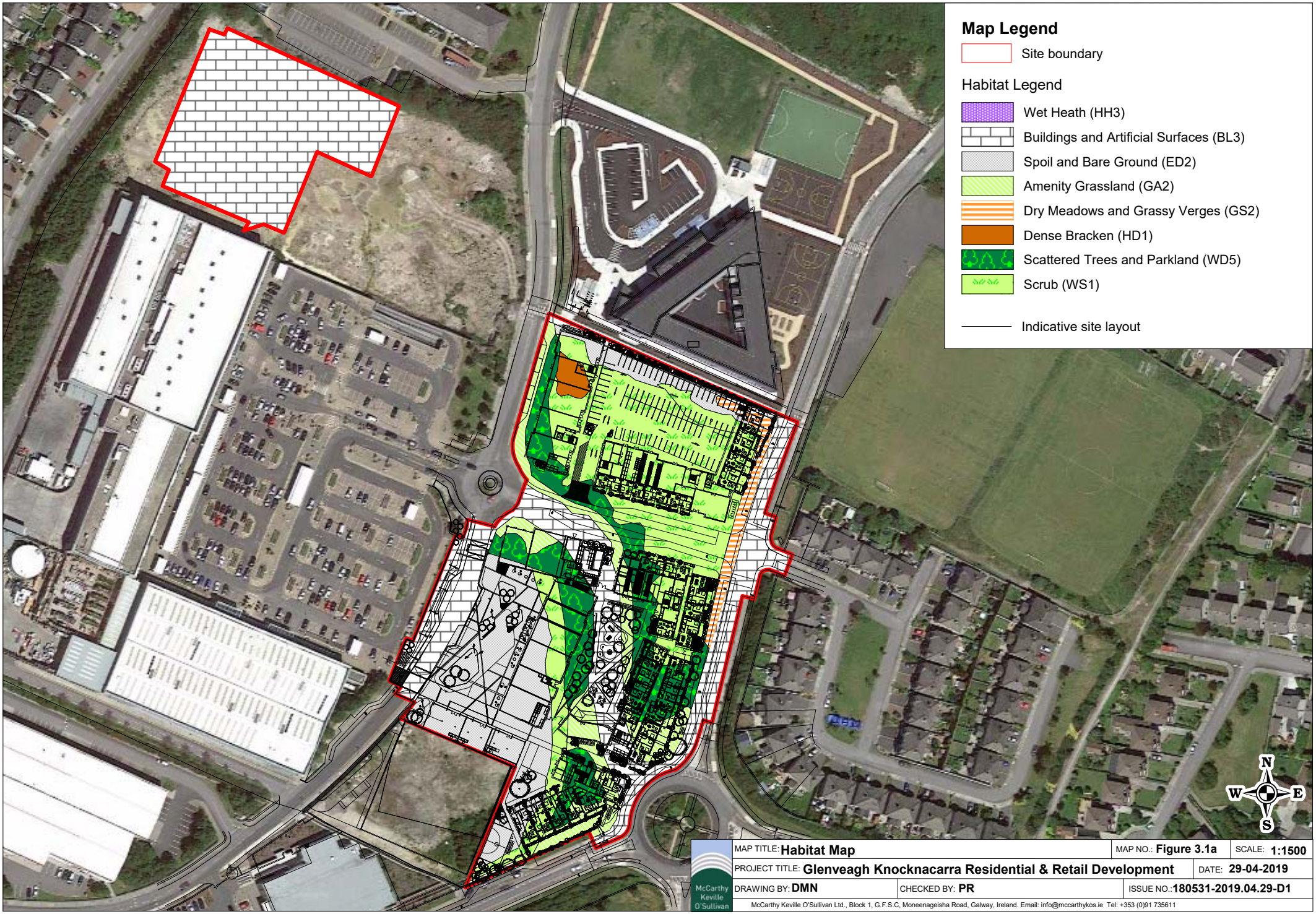
No invasive species were recorded within or adjacent to the development site. None of the habitats within the development site correspond to those listed on Annex I of the EU Habitats Directive.



MAP TITLE: **Habitat Map**		MAP NO.: **Figure 3.1**	SCALE: **1:1500**
PROJECT TITLE: **Glenveagh Knocknacarra Residential & Retail Development**			DATE: **29-04-2019**
DRAWING BY: **DMN**	CHECKED BY: **PR**		ISSUE NO.: **180531-2019.04.29-D1**

McCarthy Keville O'Sullivan

McCarthy Keville O'Sullivan Ltd., Block 1, G.F.S.C, Moneenageisha Road, Galway, Ireland. Email: info@mccarthykos.ie Tel: +353 (0)91 735611



MAP TITLE: **Habitat Map**		MAP NO.: **Figure 3.1a**	SCALE: **1:1500**
PROJECT TITLE: **Glenveagh Knocknacarra Residential & Retail Development**			DATE: **29-04-2019**
DRAWING BY: **DMN**	CHECKED BY: **PR**		ISSUE NO.: **180531-2019.04.29-D1**

McCarthy Keville O'Sullivan

McCarthy Keville O'Sullivan Ltd., Block 1, G.F.S.C, Moneenageisha Road, Galway, Ireland. Email: info@mccarthykos.ie Tel: +353 (0)91 735611

Plate 3.1: Scrub (WS1) habitat to the north of the site

Plate 3.2: Spoil and Bare Ground (ED2)

Plate 3.3: Scattered Trees and Parkland (WD5) fringing the road that bisects the site.

Plate 3.4: Road that bisects the site, classified as Buildings and artificial surfaces (BL3).

The habitats within and adjacent to the development site were evaluated in accordance with the criteria developed by the NRA (2009), which classifies sites in terms of their ecological importance, *i.e. 'international importance', 'national importance', 'county importance', 'local importance (higher value)'*

or 'local importance (lower value)'. The majority of habitats on the site are of low ecological importance. Spoil and bare ground (ED2), Recolonising bare ground (ED3), Buildings and artificial surfaces (BL3), Amenity Grassland (GA2), Bracken (HD1), Dry Meadows and Grassy Verges (GS2)) cover the majority of the site and have been categorised as Local Importance (Lower value). These habitats are highly modified and are of low ecological value. For this reason, these habitats have not been identified as a KER.

The Scattered trees and parkland (WD5) and Scrub (WS1) within the site are categorized as Local Importance (higher value) as they provide cover and commuting corridors for a variety of local flora and fauna, as well as being of local biodiversity importance. However, there is limited ecological connectivity with the surrounding landscape due to the site being surrounded by urban development.

There are no Annex I habitats listed under the EU Habitats Directive present within the Proposed development site boundary. No botanical species protected under the Flora (protection) Order (1999, as amended 2015), listed in the EU Habitats Directive (92/43/EEC), or listed in the Irish Red Data Books were recorded on the site. All species recorded are common in the Irish landscape.

No evidence of species listed under Annex II or IV of the Habitats Directive were recorded during the site visit. No evidence of bird species listed under Annex I of the Birds Directive were recorded during the site visit. The habitats within the footprint of the proposed works include scrub and highly modified habitat of low conservation value and does not provide supporting habitat for any habitats or species for which nearby SACs/SPAs have been designated.

3.1 EPA River Catchments & Watercourses

The Knocknacarra Stream (EPA reference: IE_WE_31K160960) rises to the north of the site at Letteragh and flows southward over a distance of 3km to the sea. A large portion of the lower reach of the Knocknacarra Stream is culverted, almost to its sea outfall at near Blakes Hill at Salthill. The stream which formerly ran through the site was culverted and realigned to form the surface water sewer network as part of a nearby development in 1996. This surface water sewer system ultimately discharges to Rusheen Bay and thus has connectivity to the Inner Galway Bay SPA and Galway Bay Complex SAC, in excess of 1.8km downstream (surface water distance).

The site is situated within the Galway Bay North catchment. The EPA Envision map viewer was consulted on 04th of April 2019 regarding the water quality status of the watercourses within and downstream of the Study Area. The following water quality status results were determined from the online EPA Envision map viewer. The water quality of Rusheen Bay to which the culverted stream discharges has a Coastal Waterbody Status of 'good' and a coastal waterbodies risk projection of 'not at risk'. Groundwater in the study area has a ground waterbody status of 'good'.

4. IDENTIFICATION OF EUROPEAN SITES WITH THE POTENTIAL TO BE AFFECTED

4.1 Background to European Sites

The Habitats Directive (92/43/EEC) (together with the Birds Directive (2009/147/EC)) forms the cornerstone of Europe's nature conservation policy. It is built around two pillars: the Natura 2000 network of protected sites and the strict system of species protection. All in all, the Directive protects over 1,000 animal and plant species and over 200 "habitat types" (e.g. special types of forests, meadows, wetlands, etc.), which are of European importance.

With the introduction of the EU Habitats Directive and Birds Directive which were transposed into Irish law as S.I. No. 94/1997 European Communities (Birds and Natural Habitats) Regulations 1997, the European Union formally recognised the significance of protecting rare and endangered species of flora and fauna, and also, more importantly, their habitats. The 1997 Regulations and their amendments were subsequently revised and consolidated in S.I. No. 477/2011- European Communities (Birds and Natural Habitats) Regulations 2011. This legislation requires the establishment and conservation of a network of sites of particular conservation value that are to be termed 'European Sites'.

Habitats Directive/Special Areas of Conservation

Articles 3 – 9 of the EU Habitats Directive (92/43/EEC) provide the EU legislative framework of protecting rare and endangered species of flora and fauna, and habitats. Annex I of the Directive lists habitat types whose conservation requires the designation of Special Areas of Conservation (SAC). Priority habitats, such as Turloughs, which are in danger of disappearing within the EU territory are also listed in Annex I. Annex II of the Directive lists animal and plant species (e.g. Atlantic salmon and Killarney fern) whose conservation also requires the designation of SAC. Annex IV lists animal and plant species in need of strict protection such as lesser horseshoe bat and otter, and Annex V lists animal and plant species whose taking in the wild and exploitation may be subject to management measures. In Ireland, species listed under Annex V include Irish hare, common frog and pine marten.

Species can be listed in more than one Annex, as is the case with otter and lesser horseshoe bat which are listed on both Annex II and Annex IV.

Birds Directive/Special Protection Areas

Council Directive 79/409/EEC of 2 April 1979 on the conservation of wild birds (Birds Directive) has been substantially amended several times. In the interests of clarity and rationality the said Directive was codified in 2009 and is now cited as Directive 2009/147/EC. The Directive instructs Member States to take measures to maintain populations of all bird species naturally occurring in the wild state in the EU (Article 2). Such measures may include the maintenance and/or re-establishment of habitats in order to sustain these bird populations (Article 3).

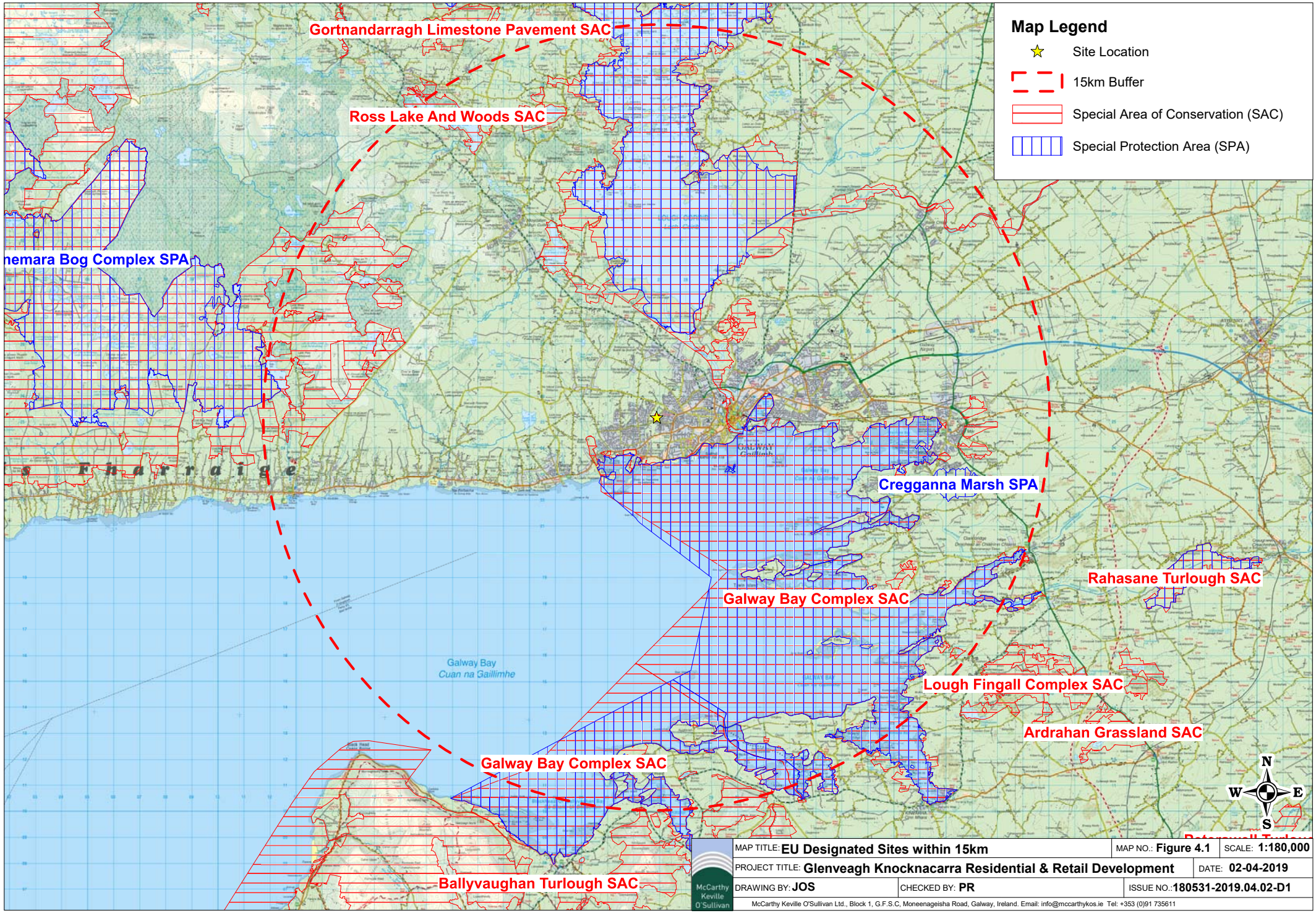
A subset of bird species have been identified in the Directive and are listed in Annex I as requiring special conservation measures in relation to their habitats. These species have been listed on account of inter alia: their risk of extinction; vulnerability to specific changes in their habitat; and/or due to their relatively small population size or restricted distribution. Special Protection Areas (SPAs) are to be identified and classified for these Annex I listed species and for regularly occurring migratory species, paying particular attention to the protection of wetlands (Article 4).

4.2 European Sites in the likely Zone of Impact of the Proposed Works

The following methodology was used to establish which European Sites are within the Likely Zone of Impact of the proposed development:

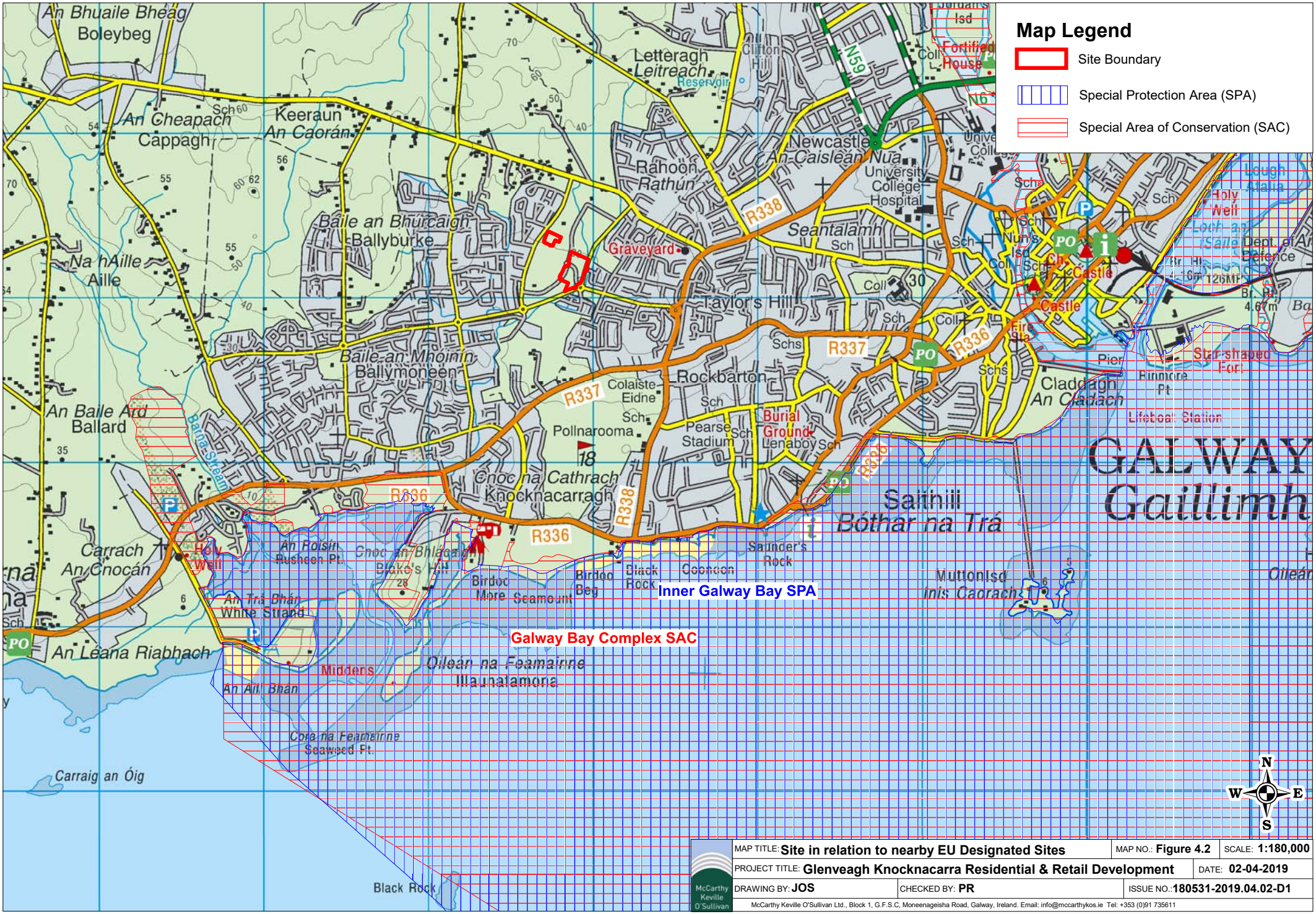
- Initially the most up to date GIS spatial datasets for European designated sites and water catchments were downloaded from the NPWS website (www.npws.ie) and the EPA website (www.epa.ie) on the 05/10/2019. The datasets were utilized to identify European Sites which could feasibly be affected by the proposed development.
- All European Sites within a distance of 15km surrounding the development site were identified and are shown on Figure 4.1 with all nearby EU Designated Sites shown in Figure 4.2. In addition, the potential for connectivity with European Sites at distances of greater than 15km from the proposed development was also considered in this initial assessment. In this case, no potential connectivity with sites located at a distance of over 15km from the proposed development was identified.
- In relation to Special Protection Areas, in the absence of any specific European or Irish guidance in relation to such sites, the Scottish Natural Heritage (SNH) Guidance, 'Assessing Connectivity with Special Protection Areas (SPA)' (2016) was consulted. This document provides guidance in relation to the identification of connectivity between proposed development and Special Protection Areas. The guidance takes into consideration the distances species may travel beyond the boundary of their SPAs and provides information on dispersal and foraging ranges of bird species which are frequently encountered when considering plans and projects.
- Table 3.1 provides details of all relevant European Sites as identified in the preceding steps and assesses which are within the likely Zone of Impact. The assessment considers any likely direct or indirect impacts of the proposed development, both alone and in combination with other plans and projects, on European Sites by virtue of the following criteria: size and scale, land-take, distance from the European Site or key features of the site, resource requirements, emissions, excavation requirements, transportation requirements and duration of construction, operation and decommissioning were considered in this screening assessment
- The site synopses and conservation objectives of these sites, as per the NPWS website (www.npws.ie), were consulted and reviewed at the time of preparing this report 05/10/2019. Figure 4.1 shows the location of the proposed development in relation to all European sites within 15km of the proposed development.
- Where potential pathways for Significant Effect are identified, the site is included within the Likely Zone of Impact and further assessment is required.

Details of these sites, including their distance from the proposed development, are provided in Table 4.1.



MAP TITLE: **EU Designated Sites within 15km**		MAP NO.: **Figure 4.1**	SCALE: **1:180,000**
PROJECT TITLE: **Glenveagh Knocknacarra Residential & Retail Development**			DATE: **02-04-2019**
DRAWING BY: **JOS**	CHECKED BY: **PR**		ISSUE NO.:**180531-2019.04.02-D1**

McCarthy Keville O'Sullivan Ltd., Block 1, G.F.S.C, Moneenageisha Road, Galway, Ireland. Email: info@mccarthykos.ie Tel: +353 (0)91 735611



MAP TITLE: **Site in relation to nearby EU Designated Sites**		MAP NO.: **Figure 4.2**	SCALE: **1:180,000**
PROJECT TITLE: **Glenveagh Knocknacarra Residential & Retail Development**			DATE: **02-04-2019**
DRAWING BY: **JOS**	CHECKED BY: **PR**		ISSUE NO.: **180531-2019.04.02-D1**

McCarthy Keville O'Sullivan Ltd., Block 1, G.F.S.C, Moneenageisha Road, Galway, Ireland. Email: info@mccarthykos.ie Tel: +353 (0)91 735611

Table 4.1 Determination of European Sites within the Likely Zone of Impact

European Site	Qualify Interests/Special Conservation Interests for which the European Site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 05/10/2019)	Conservation Objectives	European Site
Special Area of Conservation (SAC)			
Galway Bay Complex SAC 1.3km	› Mudflats and sandflats not covered by seawater at low tide [1140] › Coastal lagoons [1150] › Large shallow inlets and bays [1160] › Reefs [1170] › Perennial vegetation of stony banks [1220] › Salicornia and other annuals colonising mud and sand [1310] › Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] › Mediterranean salt meadows (*Juncetalia maritimi*) [1410] › Turloughs [3180] › *Juniperus communis* formations on heaths or calcareous grasslands [5130] › Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210] › Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae* [7210] › Alkaline fens [7230] › *Lutra lutra* (Otter) [1355] › *Phoca vitulina* (Harbour Seal) [1365]	Detailed conservation objectives for this site, dated April 2013, were reviewed as part of the assessment and are available at www.npws.ie	Despite the fact that there are no watercourses present on the site, following the precautionary principle, there is connectivity with Galway Bay Complex SAC, via the culverted watercourses that now form the storm water sewer, discharging to Rusheen Bay and the public sewer system. Indirect impacts on the following QIs can be ruled out due to the terrestrial nature of the habitats/species, the distance from the proposed development site and the absence of a complete source-pathway-receptor chain: › Turloughs [3180] › *Juniperus communis* formations on heaths or calcareous grasslands [5130] › Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (*important orchid sites) [6210] › Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae* [7210] › Alkaline fens [7230] Potential for impact on these habitats/species is therefore not considered further in this document.

European Site	Qualify Interests/Special Conservation Interests for which the European Site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 05/10/2019)	Conservation Objectives	European Site
			Despite the fact that there are no watercourses present on the site, following the precautionary principle, there is connectivity with the SAC, in excess of 1.8km downstream (surface water distance), via the culverted watercourses that now form the storm water sewer, discharging to Rusheen Bay and the public sewer system. In the absence of appropriate mitigation, there is therefore potential for indirect impact on the supporting habitat of the following QIs as a result of the deteriorating in surface water quality: › Mudflats and sandflats not covered by seawater at low tide [1140] › Coastal lagoons [1150] › Large shallow inlets and bays [1160] › Reefs [1170] › Perennial vegetation of stony banks [1220] › Salicornia and other annuals colonising mud and sand [1310] › Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] › Mediterranean salt meadows (*Juncetalia maritimi*) [1410] › *Lutra lutra* (Otter) [1355] › *Phoca vitulina* (Harbour Seal) [1365] The potential for adverse effects on these habitats and species is therefore considered further in this document.

European Site	Qualify Interests/Special Conservation Interests for which the European Site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 05/10/2019)	Conservation Objectives	European Site
Lough Corrib SAC 2.5km	› Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) [3110] › Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or *Isoeto-Nanojuncetea* [3130] › Hard oligo-mesotrophic waters with benthic vegetation of Chara spp. [3140] › Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260] › Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210] › Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) [6410] › Active raised bogs [7110] › Degraded raised bogs still capable of natural regeneration [7120] › Depressions on peat substrates of the Rhynchosporion [7150] › Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae* [7210] › Petrifying springs with tufa formation (Cratoneurion) [7220] › Alkaline fens [7230]	Detailed conservation objectives for this site (Version 1, April 2017) were reviewed as part of the assessment and are available at www.npws.ie	This SAC is located 2.5km north of the proposed works area in a separate hydrological catchment. The SAC is situated outside the core foraging range for the lesser horseshoe bat (core foraging range of 2.5km) (NPWS, 2018). The proposal will therefore not impact on the QI population for which the SAC has been designated. No source-pathway-receptor chain for impact was identified between the proposed works area and the habitats for which this site has been designated. Potential for direct or indirect impact on the European Site can be excluded. This site is not within the likely zone of impact and no further assessment is required.

European Site	Qualify Interests/Special Conservation Interests for which the European Site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 05/10/2019)	Conservation Objectives	European Site
	› Limestone pavements [8240] › Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0] › Bog woodland [91D0] › *Margaritifera margaritifera* (Freshwater Pearl Mussel) [1029] › *Austropotamobius pallipes* (White-clawed Crayfish) [1092] › *Petromyzon marinus* (Sea Lamprey) [1095] › *Lampetra planeri* (Brook Lamprey) [1096] › *Salmo salar* (Salmon) [1106] › *Rhinolophus hipposideros* (Lesser Horseshoe Bat) [1303] › *Lutra lutra* (Otter) [1355] › *Drepanocladus vernicosus* (Slender Green Feather-moss) [1393] › *Najas flexilis* (Slender Naiad) [1833]		
Connemara Bog Complex SAC 10km	› Coastal lagoons [1150] › Reefs [1170] › Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) [3110] › Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or *Isoeto-Nanojuncetea* [3130] › Natural dystrophic lakes and ponds [3160]	Detailed conservation objectives for this site (Version 1, October 2015) were reviewed as part of the assessment and are available at www.npws.ie	This SAC is located 10km west of the proposed development site. No source-pathway-receptor chain for impact was identified between the proposed development and the habitats for which this site has been designated. Based on the nature and scale of the development and the distance from this SAC, potential for direct or indirect impact on the European Site can be excluded. This site is not within the likely zone of impact and no further assessment is required.

European Site	Qualify Interests/Special Conservation Interests for which the European Site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 05/10/2019)	Conservation Objectives	European Site
	› Water courses of plain to montane levels with the *Ranunculion fluitantis* and Callitricho-Batrachion vegetation [3260] › Northern Atlantic wet heaths with *Erica tetralix* [4010] › European dry heaths [4030] › Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) [6410] › Blanket bogs (* if active bog) [7130] › Transition mires and quaking bogs [7140] › Depressions on peat substrates of the *Rhynchosporion* [7150] › Alkaline fens [7230] › Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0] › *Euphydryas aurinia* (Marsh Fritillary) [1065] › *Salmo salar* (Salmon) [1106] › *Lutra lutra* (Otter) [1355] › *Najas flexilis* (Slender Naiad) [1833]		
Ross Lake and Woods SAC 12.2km	› Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp. [3140] › *Rhinolophus hipposideros* (Lesser Horseshoe Bat) [1303]	Detailed conservation objectives for this site (Version 1, October 2018) were reviewed as part of the assessment and are available at www.npws.ie	This SAC is located 12.2km north-west of the proposed development site and is in a separate hydrological catchment. No source-pathway-receptor chain for impact was identified between the site of the proposed works area and the habitats for which this site has been designated.

European Site	Qualify Interests/Special Conservation Interests for which the European Site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 05/10/2019)	Conservation Objectives	European Site
			The SAC is situated outside the core foraging range for the lesser horseshoe bat (core foraging range of 2.5km). The proposal will therefore not impact on the QI population for which the SAC has been designated. Potential for direct or indirect impact on the European Site can be excluded. This site is not within the likely zone of impact and no further assessment is required.
East Burren Complex SAC 13.8km	› Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp. [3140] › Turloughs [3180] › Water courses of plain to montane levels with the *Ranunculion fluitantis* and Callitricho-Batrachion vegetation [3260] › Alpine and Boreal heaths [4060] › *Juniperus communis* formations on heaths or calcareous grasslands [5130] › *Calaminarian* grasslands of the *Violetalia calaminariae* [6130] › Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210] › Lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis*) [6510] › Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae* [7210]	Generic conservation objectives for this site (Version 6.0, February 2018) were reviewed as part of the assessment and are available at www.npws.ie	This SAC is located 13.8km south of the proposed development site. The site is located on the opposite side of Galway Bay in a separate hydrological catchment. The SAC is situated outside the core foraging range for the lesser horseshoe bat (core foraging range of 2.5km). The proposal will therefore not impact on the QI population for which the SAC has been designated. Based on the terrestrial nature of the habitats and lack of connectivity with the development site, potential for direct or indirect impact on the European Site can be excluded. This site is not in the zone of likely impact, no further assessment required.

European Site	Qualify Interests/Special Conservation Interests for which the European Site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 05/10/2019)	Conservation Objectives	European Site
	› Petrifying springs with tufa formation (Cratoneurion) [7220] › Alkaline fens [7230] › Limestone pavements [8240] › Caves not open to the public [8310] › Alluvial forests with *Alnus glutinosa* and Fraxinus excelsior (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0] › *Euphydryas aurinia* (Marsh Fritillary) [1065] › *Rhinolophus hipposideros* (Lesser Horseshoe Bat) [1303] › *Lutra lutra* (Otter) [1355]		
Moneen Mountain SAC 14.9km	› Turloughs [3180] › Alpine and Boreal heaths [4060] › *Juniperus communis* formations on heaths or calcareous grasslands [5130] › Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210] › Petrifying springs with tufa formation (Cratoneurion) [7220] › Limestone pavements [8240] › *Euphydryas aurinia* (Marsh Fritillary) [1065] › *Rhinolophus hipposideros* (Lesser Horseshoe Bat) [1303]	Generic conservation objectives for this site (Version 6.0, February 2018) were reviewed as part of the assessment and are available at www.npws.ie	Based on the terrestrial nature of the habitats and lack of connectivity with the development site, potential for direct or indirect impact on the European Site can be excluded. The proposed development site is outside of the core foraging range of the lesser horseshoe bat. This site is not in the zone of likely impact, no further assessment required.

European Site	Qualify Interests/Special Conservation Interests for which the European Site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 05/10/2019)	Conservation Objectives	European Site
Special Protection Area (SPA)			
Inner Galway Bay SPA 1.5km (1.97km via surface water connectivity)	› Great Northern Diver (*Gavia immer*) [A003] › Cormorant (*Phalacrocorax carbo*) [A017] › Grey Heron (*Ardea cinerea*) [A028] › Light-bellied Brent Goose (*Branta bernicla hrota*) [A046] › Wigeon (*Anas penelope*) [A050] › Teal (*Anas crecca*) [A052] › Shoveler (*Anas clypeata*) [A056] › Red-breasted Merganser (*Mergus serrator*) [A069] › Ringed Plover (*Charadrius hiaticula*) [A137] › Golden Plover (*Pluvialis apricaria*) [A140] › Lapwing (*Vanellus vanellus*) [A142] › Dunlin (*Calidris alpina*) [A149] › Bar-tailed Godwit (*Limosa lapponica*) [A157] › Curlew (*Numenius arquata*) [A160] › Redshank (*Tringa totanus*) [A162] › Turnstone (*Arenaria interpres*) [A169] › Black-headed Gull (*Chroicocephalus ridibundus*) [A179] › Common Gull (*Larus canus*) [A182] › Sandwich Tern (*Sterna sandvicensis*) [A191] › Common Tern (*Sterna hirundo*) [A193] › Wetland and Waterbirds [A999]	Detailed conservation objectives for this site (Version 1, May 2013) were reviewed as part of the assessment and are available at www.npws.ie	Despite the fact that there are no watercourses present on the site, following the precautionary principle, there is connectivity with the SPA, via the culverted watercourses that now form the storm water sewer, discharging to Rusheen Bay and the public sewer system. In the absence of appropriate mitigation, there is therefore potential for indirect impact on the supporting habitat of the following SCI as a result of the deteriorating in surface water quality: › Wetland and Waterbirds [A999] The potential for disturbance to SCI species was also considered. The development site is buffered from the SPA by the existing urban infrastructure including housing developments and roads. Due to the intervening buffer distance from the SPA and the nature of SCI species; no potential pathway for adverse disturbance related impact on SCI populations associated with the SPA was identified. In addition, the site of the proposed development does not provide suitable supporting habitat for the listed SCI species. Based on the identified pathway for impact this Designated site is within the likely zone of Impact and further assessment is required.

European Site	Qualify Interests/Special Conservation Interests for which the European Site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 05/10/2019)	Conservation Objectives	European Site
Lough Corrib SPA 3.3km	› Gadwall (*Anas strepera*) [A051] › Shoveler (*Anas clypeata*) [A056] › Pochard (*Aythya ferina*) [A059] › Tufted Duck (*Aythya fuligula*) [A061] › Common Scoter (*Melanitta nigra*) [A065] › Hen Harrier (*Circus cyaneus*) [A082] › Coot (*Fulica atra*) [A125] › Golden Plover (*Pluvialis apricaria*) [A140] › Black-headed Gull (*Chroicocephalus ridibundus*) [A179] › Common Gull (*Larus canus*) [A182] › Common Tern (*Sterna hirundo*) [A193] › Arctic Tern (*Sterna paradisaea*) [A194] › Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395] › Wetland and Waterbirds [A999]	Generic conservation objectives for this site (Version 6.0, February 2018) were reviewed as part of the assessment and are available at www.npws.ie	The proposed development site is separated from the SPA by over 3.3km and is in a separate hydrological catchment. No source-pathway-receptor chain for impact was identified between the proposed development and this SPA. The development site is buffered from the SPA existing urban infrastructure including housing developments and roads. Due to the intervening buffer distance from the SPA and the nature of SCI species; no potential pathway for adverse disturbance related impacts on SCI populations associated with the SPA was identified. No pathway for effect was identified and the site is not within the Likely Zone of Impact.
Cregganna Marsh SPA 10.8km	› Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395]	Generic conservation objectives for this site (Version 6.0, February 2018) were reviewed as part of the assessment and are available at www.npws.ie	The proposed development site is separated from the SPA by over 10.8km and is on the opposite side of Galway Bay. Due to the intervening buffer distance from the SPA and the nature of the SCI species; no potential pathway for adverse disturbance related impact on SCI populations associated with the SPA was identified. No pathway for effect was identified and the site is not within the Likely Zone of Impact.

European Site	Qualify Interests/Special Conservation Interests for which the European Site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 05/10/2019)	Conservation Objectives	European Site
Connemara Bog Complex SPA 14.4km	› Cormorant (*Phalacrocorax carbo*) [A017] › Merlin (*Falco columbarius*) [A098] › Golden Plover (*Pluvialis apricaria*) [A140] › Common Gull (*Larus canus*) [A182]	Generic conservation objectives for this site (Version 6.0, February 2018) were reviewed as part of the assessment and are available at www.npws.ie	The proposed development site is separated from the SPA by over 14.4km. The development site is buffered from the SPA existing urban infrastructure including housing developments and roads. Due to the intervening buffer distance from the SPA and the nature of SCI species; no potential pathway for adverse disturbance related impact on SCI populations associated with the SPA was identified. No pathway for effect was identified and the site is not within the Likely Zone of Impact.

4.3 Assessment of Habitats and Species Potentially affected

4.3.1 Annex I Habitats within Galway Bay Complex SAC

The Qualifying Interests with the potential to be affected via the identified pathway include:

- Mudflats and sandflats not covered by seawater at low tide [1140]
- Coastal lagoons [1150]
- Large shallow inlets and bays [1160]
- Reefs [1170]
- Perennial vegetation of stony banks [1220]
- Salicornia and other annuals colonising mud and sand [1310]
- Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]
- Mediterranean salt meadows (*Juncetalia maritimi*) [1410]

4.3.1.1 Mudflats and sandflats not covered by seawater at low tide [1140]

The extent of this habitat is illustrated on Map 3 of the site-specific conservation objective document (NPWS 2013). According to the site-specific conservation objectives (NPWS, 2013) the extent of this habitat within Galway Bay Complex SAC is estimated as 744ha, using OSI data. The nearest known mapped example of this habitat is located at Rusheen Bay, approximately 1.97km downstream downstream (surface water distance) of the proposed development site.

4.3.1.2 Coastal lagoons [1150]

The extent of this habitat is illustrated on Map 4 of the site-specific conservation objective document (NPWS 2013). According to the site-specific conservation objectives (NPWS, 2013) the extent of this habitat within Galway Bay Complex SAC is estimated as 76.7ha, using data derived from calculated from spatial data derived from Oliver, 2007. 2. The conservation objective document states that there may be more, as yet unmapped, lagoons within this SAC.

4.3.1.3 Large shallow inlets and bays [1160]

The extent of this habitat is illustrated on Map 5 of the site-specific conservation objective document (NPWS 2013). According to the site-specific conservation objectives (NPWS, 2013) the extent of this habitat within Galway Bay Complex SAC is estimated as 10,825ha using OSi data and the Transitional Water Body area as defined under the Water Framework Directive. The nearest known mapped example of this habitat is located at Rusheen Bay, approximately 1.97km downstream (surface water distance) of the proposed development site.

4.3.1.4 Reefs [1170]

The extent of this habitat is illustrated on Map 6 of the site-specific conservation objective document (NPWS 2013). According to the site-specific conservation objectives (NPWS, 2013) the extent of this habitat within Galway Bay Complex SAC is estimated as 2,773ha, using 2009 and 2010 intertidal survey data and 2009 subtidal survey data (Aquafact, 2010a, b; RPS, 2012). The nearest known mapped example of this habitat is located at Rusheen Bay approximately 1.97km downstream (surface water distance) of the proposed development site.

4.3.1.5 Perennial vegetation of stony banks [1220]

The extent of this habitat within the SAC is currently unknown according to the site-specific conservation objective document (NPWS 2013). The known extent of this habitats is listed as 0.6241ha according to the Natura Standard Data Form (NPWS, 2017) for Galway Bay Complex SAC.

4.3.1.6 Salicornia and other annuals colonising mud and sand [1310]

The extent of this habitat is illustrated on Map 9 of the site-specific conservation objective document (NPWS 2013). According to the site-specific conservation objectives (NPWS, 2013) the extent of this habitat within Galway Bay Complex SAC is estimated as 1.347ha, based on data from the Saltmarsh monitoring Project (McCorry and Ryle, 2009). This habitat was recorded at eight of the ten sub-sites surveyed with Galway Bay Complex SAC. The nearest known mapped example of this habitat is located at Rusheen Bay, approximately 1.97km downstream (surface water distance) of the proposed development site. According to the site-specific conservation objectives (NPWS, 2013), further unsurveyed examples of this habitat may occur within the SAC.

4.3.1.7 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]

The extent of this habitat is illustrated on Map 9 of the site-specific conservation objective document (NPWS 2013). According to the site-specific conservation objectives (NPWS, 2013) the extent of this habitat within Galway Bay Complex SAC is estimated as 263.80ha, based on data from the Saltmarsh monitoring Project (McCorry, 2007; McCorry and Ryle, 2009), with further unsurveyed examples of this habitat possibly occurring within the SAC. The nearest known mapped example of this habitat is located at Rusheen Bay, approximately 1.97km downstream (surface water distance) of the proposed development site, surveyed as part of the saltmarsh monitoring project 2007-2008. The survey mapped 4.37ha of saltmarsh as potential Atlantic saltmarsh with several further stands of Atlantic salt meadow identified fringing Rusheen Bay.

4.3.1.8 Mediterranean salt meadows (*Juncetalia maritimi*) [1410]

The extent of this habitat is illustrated on Map 9 of the site-specific conservation objective document (NPWS 2013). According to the site-specific conservation objectives (NPWS, 2013) the extent of this habitat within Galway Bay Complex SAC is estimated as 19.887ha, based on data from the Saltmarsh monitoring Project (McCorry, 2007; McCorry and Ryle, 2009), with further unsurveyed examples of this habitat possibly occurring within the SAC. The nearest known mapped example of this habitat is located at Rusheen Bay, approximately 1.97km downstream (surface water distance) of the proposed development site, surveyed as part of the saltmarsh monitoring project 2007-2008.

4.3.2 Annex II species of Galway Bay Complex SAC

The Qualifying Interests with the potential to be affected via the identified pathway include:

- *Lutra lutra* (Otter) [1355]
- *Phoca vitulina* (Harbour Seal) [1365]

4.3.2.1 *Lutra lutra* (Otter) [1355]

The extent of terrestrial commuting otter habitat is illustrated on Map 11 of the site-specific conservation objective document (NPWS 2013). According to the site-specific conservation objectives (NPWS, 2013) the extent of terrestrial habitat within Galway Bay Complex SAC is estimated as 262ha, above high-water mark. These areas are mapped to include a 10m terrestrial buffer above the high-water mark

along shorelines. The nearest mapped extent of this habitat is located approximately 1.97km downstream of the proposed development site. The site-specific conservation objective document notes the importance of maintaining connectivity between commuting routes.

4.3.2.2 *Phoca vitulina* (Harbour Seal) [1365]

The extent of Seal habitat and breeding, moulting and resting sites is illustrated on Map 12 of the site-specific conservation objective document (NPWS, 2013). The harbour seal population monitoring program recorded a maximum count of 105 individuals in Oranmore Bay in 2009 and 122 individuals in 2010 (NPWS, 2010; NPWS 2011).

4.3.3 Wetland habitats of the Inner Galway Bay SPA

Emissions to surface and ground water during the construction and operational phases have the potential to result in adverse impacts on *Wetlands and Waterbirds* [A999].

According to the site-specific conservation objectives the extent of wetland habitat within the SPA was estimated as 13,267ha, using OSI data and relevant orthophotographs (NPWS, 2013). The following relevant information has been extracted from the NPWS site synopsis and Natura 2000 Data From for the SPA:

> *"Inner Galway Bay SPA is a very large, marine-dominated site situated on the west coast of Ireland. The inner bay is protected from exposure to Atlantic swells by the Aran Islands and Black Head. Subsidiary bays and inlets (e.g. Poulnaclough, Aughinish and Kinvarra Bays) add texture to the patterns of water movement and sediment deposition, which lends variety to the marine habitats and communities. The terraced Carboniferous (Viséan) limestone platform of the Burren sweeps down to the shore and into the sublittoral. The long shoreline is noted for its diversity, and comprises complex mixtures of bedrock shore, shingle beach, sandy beach and fringing salt marshes. Intertidal sand and mud flats occur around much of the shoreline, with the largest areas being found on the sheltered eastern coast between Oranmore Bay and Kinvarra Bay. A number of small islands and rocky islets in the Bay are included within the site.*
>
> *The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Great Northern Diver, Cormorant, Grey Heron, Light-bellied Brent Goose, Wigeon, Teal, Shoveler, Red-breasted Merganser, Ringed Plover, Golden Plover, Lapwing, Dunlin, Bar-tailed Godwit, Curlew, Redshank, Turnstone, Black-headed Gull, Common Gull, Sandwich Tern and Common Tern. The E.U. Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds*
>
> *Inner Galway Bay SPA is of high ornithological importance with two wintering species having populations of international importance and a further sixteen wintering species having populations of national importance. The breeding colonies of Sandwich Tern, Common Tern and Cormorant are also of national importance. Also of note is that six of the regularly occurring species are listed on Annex I of the E.U. Birds Directive, i.e. Black-throated Diver, Great Northern Diver, Golden Plover, Bar-tailed Godwit, Sandwich Tern and Common Tern. Inner Galway Bay is a Ramsar Convention site and part of the Inner Galway Bay SPA is a Wildfowl Sanctuary".*

5. ASSESSMENT OF POTENTIAL IMPACTS

The Likely Zone of Impact determination (See Table 4.1) has identified a potential pathway for indirect impact in the form of surface water and groundwater pollution, which may affect the following QI/SCIs of EU Sites:

Galway Bay Complex SAC

- Mudflats and sandflats not covered by seawater at low tide [1140]
- Coastal lagoons [1150]
- Large shallow inlets and bays [1160]
- Reefs [1170]
- Perennial vegetation of stony banks [1220]
- Salicornia and other annuals colonising mud and sand [1310]
- Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]
- Mediterranean salt meadows (*Juncetalia maritimi*) [1410]
- *Lutra Lutra* (Otter) [1355]
- *Phoca vitulina* (Harbour Seal) [1365]

Inner Galway Bay SPA

- Wetland and Waterbirds [A999]

Indirect impacts of surface water pollution on the habitats of waders and wildfowl listed as SCIs of this SPA are included in the assessment of wetlands and waterbirds.

5.1 Galway Bay Complex SAC

5.1.1 Review of Conservation Objectives for Galway Bay Complex SAC

The relevant QIs and the associated conservation objectives of the site are presented in Table 5.1. The Target and Attributes for the habitats, as described in the Galway Bay Complex SAC Conservation Objectives supporting documents, were reviewed and considered in this assessment (www.NPWS.ie, 02/10/2019).

Table 5.1 Qualifying Interest and Conservation Objectives (Version 01, 2013)

Qualifying Interest	Conservation Objective
Salicornia and other annuals colonising mud and sand [1310]	To maintain the favourable conservation condition of Salicornia and other annuals colonizing mud and sand in Galway Bay Complex SAC.
Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]	To restore the favourable conservation condition of Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) in Galway Bay Complex SAC.
Mediterranean salt meadows (*Juncetalia maritimi*) [1410]	To restore the favourable conservation condition of Mediterranean salt meadows (*Juncetalia maritimi*) in Galway Bay Complex SAC.

Qualifying Interest	Conservation Objective
Reefs [1170]	To maintain the favourable conservation condition of Reefs in Galway Bay Complex SAC.
Mudflats and sandflats not covered by seawater at low tide [1140]	To maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide in Galway Bay Complex SAC.
Perennial vegetation of stony banks [1220]	To maintain the favourable conservation condition of Perennial vegetation of stony banks in Galway Bay Complex SAC
Coastal lagoons [1150]	To restore the favourable conservation condition of Coastal lagoons in Galway Bay Complex SAC
Large shallow inlets and bays [1160]	To maintain the favourable conservation condition of Large shallow inlets and bays in Galway Bay Complex SAC
Phoca vitulina (Harbour Seal) [1365]	To maintain the favourable conservation condition of Harbour Seal in Galway Bay Complex SAC
Lutra lutra (Otter) [1355]	To restore the favourable conservation condition of Otter in Galway Bay Complex SAC.

5.1.2 Review of site-specific pressures and threats for Galway Bay Complex SAC

As per the Natura 2000 Data Form (NPWS, 2015), the site-specific threats, pressures and activities with potential to impact on the SAC are as follows: H01.08 diffuse pollution to surface waters due to household sewage and waste waters (High).

- I01 invasive non-native species (Medium)
- A04.02.02 non- intensive sheep grazing (Medium)
- J02.01.02 reclamation of land from sea, estuary or marsh (Medium)
- D03.01.01 slipways (Low)
- D01.01 paths, tracks, cycling tracks (Low)
- J02.05.01 'modification of water flow (tidal & marine currents) (Low)
- J02.01.02 'reclamation of land from sea, estuary or marsh (Medium)
- G02.01 golf course (Low)
- C01.01 Sand and gravel extraction (Medium)
- H01.05 diffuse pollution to surface waters due to agricultural and forestry activities (High)
- J02.12.01 sea defense or coast protection works, tidal barrages (High)
- A04.02.01 non- intensive cattle grazing (Medium)
- D03 shipping lanes, ports, marine constructions (High)
- F02.03.01 'bait digging / collection (Low)

The proposed development relates to the construction of a residential and retail development in Knocknacarra Co. Galway. *H01.08 diffuse pollution to surface waters due to household sewage and waste waters (High)* is identified above and an activity with the potential to impact on the SAC. The activity has the potential, in the absence of best practice and mitigation, to result in pollution to surface waters.

No pathways for impact with regard to any additional site-specific threats, pressures and activities were identified.

5.2 Inner Galway Bay SPA

5.2.1 Review of Conservation Objectives for Inner Galway Bay SPA

The relevant SCI and the associated conservation objectives of the site are presented in Table 5.2. The Target and Attributes for the species, as described in the Inner Galway Bay SPA Conservation Objectives supporting documents, were reviewed and considered in this assessment (NPWS, 2013) (www.NPWS.ie, 02/10/2019).

Table 5.2 Qualifying Interest and Conservation Objectives (Version 01, 2013)

Special Conservation Interest	Conservation Objective (Version 01, May 2013)
Wetland [A999]	*'To maintain the favourable conservation condition of wetland habitat in Inner Galway Bay SPA as a resource for the regularly occurring migratory waterbirds that utilise it.'*

5.2.2 Review of site-specific pressures and threats for Inner Galway Bay SPA

As per the Natura 2000 Data Form (NPWS, 2015), the site-specific threats, pressures and activities with potential to impact on the SPA are as follows:

- E02 Industrial or commercial areas (Medium)
- A04 grazing (Low)
- F01 Marine and Freshwater Aquaculture (Medium)
- G01.02 walking, horse-riding and non-motorised vehicles (Medium)
- J02.12 'Dykes, embankments, artificial beaches, general (Medium)
- J02.01.02 reclamation of land from sea, estuary or marsh (High)
- A08 Fertilisation (Medium)
- E01 Urbanised areas, human habitation (High)
- F02.03 Leisure fishing (Medium)
- E03 Discharges (High)
- F03.01 Hunting (Low)
- G01.01 nautical sports (Medium)
- D01.02 roads, motorways (Medium)

E03 Discharges (High) has been identified above as an activity with the potential to impact on the SPA. The development has the potential, in the absence of best practice and mitigation, to result in discharges to surface water.

The impact assessment of the proposed development identified potential for water pollution associated with the construction phase and operational phases of the development.

6. ASSESSMENT OF PATHWAYS FOR ADVERSE EFFECT

6.1 Potential for Direct Effects on the European Sites

There will be no direct effects on the Qualifying Interest of Galway Bay Complex SAC or Inner Galway Bay SPA. There will be no land take associated with the proposal as the development site is located entirely outside of any EU Designated Site.

6.2 Potential for Indirect Effects on the European Sites

6.2.1 Effects on Surface water

Impacts on water quality during the construction and operational phase were identified as having the potential to result in adverse effects on the following Qualifying Interests of the Galway Bay Complex SAC:

- Mudflats and sandflats not covered by seawater at low tide [1140]
- Coastal lagoons [1150]
- Large shallow inlets and bays [1160]
- Reefs [1170]
- Perennial vegetation of stony banks [1220]
- Salicornia and other annuals colonising mud and sand [1310]
- Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]
- Mediterranean salt meadows (*Juncetalia maritimi*) [1410]
- *Lutra lutra* (Otter) [1355]
- *Phoca vitulina* (Harbour Seal) [1365]

These impacts also have the potential to result in adverse effects on the following Special Conservation Interests of the Inner Galway Bay SPA:

- Wetlands and Waterbirds

An assessment of the potential effects on the above water dependent receptors is provided in the following subsections. This assessment is informed by the detailed field and desk surveys that were undertaken and are described in this NIS.

The potential for adverse effects on each of the QI/SCI in view of its site-specific conservation objectives has been considered in this assessment. Details of the assessment of the potential for adverse effects on the site-specific targets and attributes for each individual habitat or species are provided in Appendix 2 of this NIS.

6.2.2 Consideration of impacts on water quality during construction

The construction of the development will involve earth moving and levelling operations which create the potential for pollution in various forms to run off the site, i.e. the generation of suspended solids and the potential for spillage of fuels associated with the refuelling of excavation machinery. Taking a

precautionary approach the construction works have potential, in the absence of mitigation, to impact on groundwater and surface water quality. Pollutants may run off the site into the public stormwater system outside the site, which ultimately discharges to Rusheen Bay, thus having connectivity to Inner Galway Bay SPA and Galway Bay Complex SAC. There is also the possibility that pollutants may percolate through the ground ultimately discharge to the SAC/SPA via this diffuse pathway.

Mitigation

Standard best practice environmental control measures will be implemented during the construction phase of the development. The pathway that would allow potential impacts to occur was considered in the design of the project. Section 2.2.3 of this report sets out the environmental management framework to be adhered to during the construction phase of the development and it incorporates the mitigating principles to ensure no adverse impact on the integrity of European Sites. Section 2.2.3 includes comprehensive detail regarding site set up, pollution prevention, hydrocarbon management, disturbance limitation, construction monitoring and biosecurity.

Standard best practice environmental control measures have been incorporated in the design of the development and are outlined in the following subsections. In addition, the *'Infrastructure Design Report* '(DBFL Consulting Engineers, 2019) and the *Preliminary Construction Management Plan* (DBFL Consulting Engineers, 2019), (see Appendix 1), includes measures for the avoidance of impact on groundwater and surface water during construction. The following pollution control measures will be put in place:

- Sediment and Erosion – Adjacent drainage systems/groundwater need to be protected from sedimentation and erosion due to direct surface water runoff generated onsite during the construction phase. To prevent this from occurring surface water discharge from site will be managed and controlled for the duration of the construction works until the permanently surface water drainage system of the proposed site is complete. A temporary drainage system shall be installed prior to the commencement of the construction works to collect surface water runoff by the site during construction.
- Accidental Spills and Leaks – All oils, fuels, paints and other chemicals will be stored in a secure bunded construction hardstand area. Refuelling and servicing of construction machinery will take place in a designated hardstand area which is also remote from any drainage systems. A response procedure will be put in place to deal with any accidental pollution events and spillage kits will be available and construction staff will be familiar with the emergency procedures and use of the equipment.
- Concrete – Concrete batching will take place off site, wash down and wash out of concrete trucks will take place off site and any excess concrete is not to be disposed of on site. Pumped concrete will be monitored to ensure there is no accidental discharge. Mixer washings are not to be discharged into surface water drains.
- Disposal of Wastewater from Site – Discharge from any vehicle wheel wash areas is to be directed to on-site settlement tanks/ponds, debris and sediment captured by vehicle wheel washes are to be disposed off-site at a licensed facility.
- Foul drainage discharge from the construction compound will be tankered off site to a licensed facility until a connection to the public foul drainage network has been established.

The following guidelines and documents will inform the detailed planning of the works phase:

- Good practice guidelines on the control of water pollution from construction sites developed by the Construction Industry Research and Information Association (CIRIA) in particular;
- C532 Control of water pollution from construction sites: guidance for consultants and contractors (Masters-Williams et al, 2001); and
- SP156 Control of water pollution from construction sites - guide to good practice (Murnane et al, 2002).

6.2.3 Consideration of impacts on water quality during the operational phase

The operational phase of the proposed project will result in the production of foul sewage and surface water. If not adequately treated, there is potential for indirect impacts on ground water and surface water quality.

Foul Sewage – Mitigation by Design

All foul water will be discharged to the public sewer and will be treated at the Galway Mutton Island Wastewater Treatment Plant before discharges to Galway Bay. Irish Water have upgraded the Mutton Island Wastewater Treatment facility under the Capital Investment Plan 2014-2016 (Galway Sewerage Scheme Phase 3 – Network Upgrade Contract No.1 Volume D). The upgrade increases the capacity of the plant from 92,000 to 170,000 p.e. (Galway City Council, 2017[2]).”

Treatment process includes the following:

- Preliminary Treatment (Screening & Grit Removal)
- Primary Treatment (Upward Flow Settlement Tanks)
- Secondary Treatment (Activated Sludge)

There is full agreement with Irish Water that there is adequate capacity and capability to fully treat all sewage generated by the proposed project in the public sewage treatment system. Correspondence with Irish Water, Reference No 1000850255, is provided in Appendix 3 of this NIS. The proposed project, as assessed for the confirmation of feasibility, is a standard connection, requiring no network or treatment plant upgrades or water or wastewater by either the customer or Irish Water. Given that waste will be appropriately treated to the required standards in the public sewer system; no potential for adverse impact on water quality exists.

Surface Water Runoff – Mitigation by Design

The surface water drainage design is described in the ‘Infrastructure Design Report’ (DBFL Consulting Engineers, 2019).

It is proposed to divert the existing surface water sewers within the site to align the drainage layout with the proposed diversion of the existing access road to the Gateway Retail Park. Both the northern portion of the site (Site 2) and the southern area of the site (Site 1) of the proposed development will be provided with a surface water drainage network to collect surface water flows from the apartment blocks and commercial units. The Site 1 storm drainage will discharge attenuated outflows to the existing 450mm diameter sewer to the south-west of the site. The Site 2 storm drainage will be constructed in the ground floor car park and attenuated outflows will connect with the existing 375mm diameter sewer to the north-west of the site. The surface water strategy incorporates attenuation of storm water to limit discharge from the site, although storage facilities and SUDs elements will be designed to allow infiltration or reduction of run-off volumes and rates where possible.

Run-off from roofs and any additional run-off from the landscaped courtyard podium slab is designed to be conveyed to the surface water drainage network at ground floor level. Two underground surface water attenuation tanks will be provided for the development to attenuate surface water flows for the

[2] *Galway City Council, 2017, Galway City Council Draft Development Plan 2017-2023, Online; Available at https://galwaycitycommunitynetwork.ie/wp-content/uploads/2016/01/GalwayCityDraftDevelopmentPlan2017-2023_Web.pdf, Accessed, 11.10.2019*

100 year critical storm + 10% allowance for climate change. One concrete attenuation tank will be located beneath the ground floor car park in Site 2, and one 'Stormtech' attenuation system will be located beneath the civic plaza in Site 1.

The podium (landscaped courtyard) consists mainly of green areas, soft landscaped areas and raised planters providing interception storage and treatment. The hard-standing area of the podium, which is of a north-south pedestrian link will consist of impermeable paving. A number of gullies at podium slab level will drain any residual runoff from the landscaped courtyard to the surface water network at ground level.

The surface water strategy incorporates attenuation of storm water to limit discharge from the site, although storage facilities and SUDs elements will be designed to allow infiltration or reduction of run-off volumes and rates where possible.

As outlined in the *'Infrastructure Design Report'* (DBFL Consulting Engineers, 2019), all run-off from roofs and areas of hardstanding will be conveyed to the surface water drainage network at ground floor level. Sustainable urban drainage system (SUDS) elements will be incorporated in to the design and will include the following:

- Porous asphalt paving on part of civic plaza to provide treatment, storage and reduce run-off rates.
- Green podium with landscaped areas and raised planters to reduce run-off rates and total impermeable area.
- Two off-line attenuation storage systems for the attenuation of flood water up to the 100 year storm event + 10% allowance for climate change.
- A Class 1 Bypass Separators to be provided on the outfall from each network.
- Surface water run-off from the overall development will be attenuated to greenfield runoff rates.
- To prevent pollutants or sediments discharging into water courses, interception storage will receive the run-off for rainfall depths of 5mm up to 10mm. The SUDS features include porous asphalt and landscaped podium will provide the necessary interception volume.

6.3 Conclusion of Impact Assessment

Taking cognisance of best practice measures incorporated into the project design as described in the preceding sections and in Section 22 of this NIS, the Proposed Development will not result in adverse effects on the integrity of the European Sites. It will not prevent the QIs/SCIs of the European Sites from achieving favourable conservation status in the future as defined in Article 1 of the EU Habitats Directive. A definition of Favourable Conservation Status is provided below:

> *'conservation status of a species means the sum of the influences acting on the species concerned that may affect the long-term distribution and abundance of its populations within the territory referred to in Article 2;*
> *The conservation status will be taken as 'favourable' when:*
>
> - Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and
> - The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
> - There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.'

Based on the above, it can be concluded in view of best scientific knowledge, on the basis of objective information that the Proposed Development will not adversely affect the Qualifying Interests/Special Conservation Interests associated with the Galway Bay Complex SAC or the Inner Galway Bay SPA.

7. CUMULATIVE EFFECTS

7.1.1 Review of other plans and projects

The potential for the proposed works to contribute to a cumulative impact on European Sites was considered. The online planning system for Galway County Council was consulted on the 05/04/2019. Additional projects identified in the area from the last 5 years include;

- Extension of duration on Pl. Ref. No. 08/506 - Permission for a mixed-use development on site of 0.65 hectares (1.6 acres) (Planning reference: 14228)
- Permission for development which will consist of: Phase 2 of Knocknacarra District Centre comprising a mixed-use 2 storey development (with plant areas at roof level) of c. 11,969.3 sq. m as follows: 6 no. retail units (units 12-17, c. 9,688.6 sq. m GFA); crèche (unit 11, c. 444.4 sq. m) with an external play area; café/restaurant (unit 9, c. 197 sq. m); first floor gym (unit 18, c. 678.1 sq. m) as well as offices (units 7, 8 & 10, c. 786.5 sq. m); provision of new east/west pedestrian link; signage zones c. 143.68 sq. m, canopies on southern elevation; 129 no. basement and 22 no. surface car parking spaces; 116 no. cycle spaces (at surface level); all located to the north of existing Dunnes Stores and surface car park. Permission is also sought for associated ancillary development comprising service yards, refuse areas, hard and soft landscaping, single storey ESB substation (58.2 sq. m), basement entrance, vents, revised surface circulation in south east corner of site; basement level plant, attenuation areas (& foul pump), works and build out of basement area (to also tie in with existing basement), and all associated site development & drainage works (Planning reference: 17158)
- Permission for development which will consist of the construction of a new 2 storey Primary School building with a section of the building rising to 3 storey and comprising of 24 no. general classrooms, General Purpose Hall with servery area, staff room, Library and Resource Room, Special Educate Tuition Rooms, offices, staff areas, sanitary and ancillary accommodation with a total floor area of C. 3982m.sq. Proposed site works to include provision for 36no. surface car parking spaces including accessible parking via new internal vehicular and pedestrian access from Distributor Road, new internal access road to include bus turning circle, drop-off and pick-up facilities. A new pedestrian access route to the south of the site. External works to include bicycle parking, formation of 3 no. basketball courts, junior play areas, external bin store, ESB sub-station and associated site engineering works (Planning reference: 1511)
- Retention permission for existing bus park at Rahoon, Galway. The works consist of, a) Retention for demolition of two agricultural sheds 291sqm. b) Retention for revised site boundary and additional area 400sq (Planning reference: 15232).
- Permission for extension to Pure Skill within Millars Hall for additional amenity use. The works to include: i) Provide 617.85 sqm of existing ground floor area to be used for amenity use previously permitted amenity as Unit 7, Pl. Ref. 04/573 and Unit 3, Pl. Ref. 1066/03. ii) Provide 475.0 sqm of New First Floor Area to be used for amenity use and to allow balcony overview of existing ground floor amenity areas. iii) Enclosure of an entrance lobby of 32.5 sqm, under the existing roof canopy granted under 362/99 to allow dual access to the extended facility with related minor variations to existing South Western elevation. This requires the change of the existing industrial high delivery entrance door to an additional personnel access door and to relocate it forward by 6m into the revised front elevation and existing building line. iv) Retention of additional existing 41.40 sqm of first floor ancillary office, viewing area and coffee shop whereby 105.70 sq.m of first floor was permitted and occupied under Pl. Ref. 153/02 v) Form 108 sqm of new road surface within the existing site to link existing front and rear carparking areas, while retaining 15% of the site area as open space. vi) Erect 4 No. building name signs, Millars Hall on the front and side elevations of Millars Hall and 3 No. business name signs over personnel access doors. vii) Erect 3 No. free standing name board sign frames one at each of the two entrances to Millars Hall and one at the junction with

Botháir Stiofáin for the respective business there in. The works to connect to existing services and parking permitted and constructed under Pl. Ref. 362/99 (Planning reference: 15274).

- Permission for construction of two storey dwelling house, domestic garage and all associated site works and services (Planning reference: 15373)
- Permission to construct a two storey house with attic storage space, a separate domestic garage and all associated works at a site accessed from the Linn Bhui estate (Planning reference: 1583).
- Permission for development is being sought for an extension within Millars Hall to include: a) 165.3sqm of first floor loft within Millars Hall to be used for amenity use. B) Enclosure of an entrance lobby of 35.4sqm under the existing roof canopy. C) Minor renovations to existing elevations. The works to connect to existing services & parking permitted & constructed under Pl. Ref. 362/99 for Millars Hall. (16136)
- Extension of duration on Pl. Reg. Ref. No. 10/285 - Permission for amendments/modifications to the restaurant part of the District Centre development previously permitted under Reg. Ref. 04/141 (Bord Ref. PL 61.210888). The proposed development will modify the restaurant previously granted under the above permission and provide for a fast food restaurant and drive thru, with a gross internal floor area of 455m.sq over two levels plus associated corporate signage of 20m.sq to the external façade and surrounds. It is also proposed to provide an off street loading bay to the main estate road for servicing the unit plus all associated site development works for the proposed development (1683)
- Permission for development to construct a new dwelling house, with connection to the existing services, and accessed via the Linn Bhui housing estate (Planning reference: 1696)
- Permission for development which will consist of: Phase 2 of Knocknacarra District Centre comprising a mixed-use 2 storey development (with plant areas at roof level) of c. 11,969.3 sq. m as follows: 6 no. retail units (units 12-17, c. 9,688.6 sq. m GFA); crèche (unit 11, c. 444.4 sq. m) with an external play area; café/restaurant (unit 9, c. 197 sq. m); first floor gym (unit 18, c. 678.1 sq. m) as well as offices (units 7, 8 & 10, c. 786.5 sq. m); provision of new east/west pedestrian link; signage zones c. 143.68 sq. m, canopies on southern elevation; 129 no. basement and 22 no. surface car parking spaces; 116 no. cycle spaces (at surface level); all located to the north of existing Dunnes Stores and surface car park. Permission is also sought for associated ancillary development comprising service yards, refuse areas, hard and soft landscaping, single storey ESB substation (58.2 sq. m), basement entrance, vents, revised surface circulation in south east corner of site; basement level plant, attenuation areas (& foul pump), works and build out of basement area (to also tie in with existing basement), and all associated site development & drainage works. Primary vehicular access to the proposal will be from new entrance (at northern boundary) from internal access road, all on a site of c. 1.56 hectares (planning ref: 17158).
- Permission to construct a dwellinghouse and domestic garage with all associated site works and services (Planning reference: 1798)
- Permission to construct a dwellinghouse and domestic garage with all associated site works and services (Planning reference: 17327)
- A single storey "Ionad Gaeilge" "Arás Mhic Amhlaigh" in order to provide pre school and after school facilities for the school community. The facilities comprise: 3 no. classrooms for naionra and after school facilities, a multi- purpose room, offices, staff areas and ancillary accommodation with a total floor area of c. 485sqm. The proposed site works to include provision of 21 no. surface car parking spaces with accessible parking spaces driveway/car turing area and drop off pick up area; footpath and landscaped area; secured outdoor play area; connection to existing services and associated site works at Gaelscoil Mhic Amhlaigh Campus, Rahoon, Knocknacarra, Galway (Planning reference: 18134).
- Permission for construction of dwelling house shed and all associated site works and services at site (Planning reference: 1842).

- Permission for construction of dwelling house with self contained granny flat and all associated site works and services (Planning reference: 18122)
- E.O.D on Pl. Ref 13/268: Permission for development will consist of full permission to construct a dormer dwelling house, garage and all associated site development works (Planning reference: 18346).
- Permission for development which consists of a pair of semi-detached houses, garden sheds, and all associated site works and services at site (Planning reference: 1967)

The Policies and Objectives of the Galway County Development Plan 2015-2021 and Galway City Council Development Plan 2017-2023 were reviewed as part of the proposal.

Whilst the N6 Galway City Ring Road is not permitted, the planning application is under consideration by An Bord Pleanála and the proposed route is located to the north of the proposed project. The documentation that was submitted with that planning application was thoroughly reviewed in the context of this cumulative assessment along with all the information available from the route selection report for the Galway City Transport Project (previously used name for the consideration of the Galway City Ring Road) and all available information on that project was considered in the planning and assessment of the current project. Ecological information available from the assessments conducted for the projects listed above were taken into account as part of the assessment.

All foul water will be discharged to the public sewer and will be treated at the Galway Mutton Island Wastewater Treatment Plant before discharging to Galway Bay. Irish Water have upgraded the Mutton Island Wastewater Treatment facility under the Capital Investment Plan 2014-2016 (Galway Sewerage Scheme Phase 3 – Network Upgrade Contract No.1 Volume D). The upgrade increases the capacity of the plant from 92,000 to 170,000 p.e. (Refernce City Plan)." There is full agreement with Irish Water that there is adequate capacity and capability to fully treat all sewage generated by the proposed project in the public sewage treatment system. The proposed project, as assessed for the confirmation of feasibility, is a standard connection, requiring no network or treatment plant upgrades or water or wastewater by either the customer or Irish Water.

Following the implementation of the best practice measures outlined in section 2.2 of this report, all potential impact pathways for effect have been blocked. There is therefore no potential for impact on EU Designated Sites in combination with other plans and projects.

7.1.2 Conclusion of in-combination/cumulative assessment

No European Sites were considered to be at risk from cumulative effects given the nature and scale of the proposed works, and the implementation of the preventative measures to avoid effects outlined in Section 2.2.3 of this report. As there is no potential for the currently proposed works to result in any individual effect on any European Site, therefore it cannot contribute to any cumulative effect.

Each of the projects listed above in Section 6.1.1 have been/will be subject to the local authority's appropriate assessment process as part of the planning consent process. No residual pollution or disturbance effects are anticipated.

No cumulative and/or in-combination pollution, disturbance, displacement or habitat loss effects on any of the QIs or SCIs have been identified with regard to the proposed works.

8. CONCLUDING STATEMENT

This NIS has provided an assessment of all potential direct or indirect adverse effects any European Sites. Potential pathways for effect on the QI/SCI habitats and species of Galway Bay Complex SAC and Inner Galway Bay SPA were identified.

All identified potential pathways for impact are robustly blocked through the use of avoidance, appropriate design and mitigation measures as set out within this report. The measures ensure that the construction and operation of the proposed development does not adversely affect the integrity of European sites.

Therefore, it can be objectively concluded that the proposed development, individually or in combination with other plans or projects, will not adversely affect the integrity of any European Site.

BIBLIOGRAPHY

Birds Directive (2009/47/EC) – http://ec.europa.eu/environment/naturelegislation/birdsdirective /index _en.htm

CIEEM (2018) Institute of Ecology and Environmental Management Guidelines for Ecological Impact Assessment. (9) EC (2001) Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC

Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (Habitats Directive) and Directive 2009/147/EC (codified version of Directive 79/409/EEC as amended) (Birds Directive) – transposed into Irish law as European Communities (Birds and Natural Habitats) Regulations 2011 (SI 477/2011)

DEHLG (2009) Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities. DEHLG, Dublin.

DoEHLG (2010). Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities. Revision, February, 2010. Department of the Environment, Heritage and Local Government.

EC (2000) Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC, Office for Official Publications of the European Communities, Luxembourg. European Commission.

EC (2018) Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC, Office for Official Publications of the European Communities, Luxembourg. European Commission.

EC (2001) Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Articles 6(3) and (4) of the Habitats Directive 92/43/EEC.

EC (2002) Assessment of Plans and Projects Significantly Affecting Natura 2000 Sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC, Office for Official Publications of the European Communities, Luxembourg. European Commission.

EC (2007a) Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC – Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence, opinion of the commission. Office for Official Publications of the European Communities, Luxembourg. European Commission.

EC (2013) Interpretation Manual of European Union Habitats. Version EUR 28. European Commission, DG Environment.

EPA (2002) Guidelines on the information to be contained in Environmental Impact Statements. Environmental Protection Agency.

EPA (2003) Advice Notes on current practice in the preparation of Environmental Impact Statements. Environmental Protection Agency.

EPA website: http://www.epa.ie.

European Communities (Natural Habitats) Regulations, SI 94/1997, SI 233/1998 & SI 378/2005 – http://www.irishstatutebook.ie.

Galway Bay complex SAC, Conservation Objectives Series. Version 1. (NPWS, 2013)

Galway City Council Development Plan (2017-2023)

Galway County Development Plan (2015-2021)

Habitats Directive (92/43/EEC).

McCorry, M., 2007. Saltmarsh Monitoring Project 2006. *Unpublished report to the National Parks and Wildlife Service, Dublin.*

McCorry, M. and Ryle, T., 2009. Saltmarsh Monitoring Project. *National Parks and Wildlife Service*.

NPWS (2013) The Status of EU Protected Habitats and Species in Ireland. Conservation Status in Ireland of Habitats and Species listed in the European Council Directive on the Conservation of Habitats, Flora and Fauna 92/43/EEC.

NPWS of the DEHLG (2013) The Report on Status of Habitats and Species in Ireland: Technical Reports and Forms.

NPWS Protected Site Synopses available on http://www.npws.ie/en/ProtectedSites/.

NPWS (2010) Harbour Seal Pilot Monitoring Project. National Parks & Wildlife Service, Department of Arts, Heritage and the Gaeltacht

NPWS (2011) Harbour Seal Pilot Monitoring Project. National Parks & Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS (2018) Conservation objectives supporting document –lesser horseshoe bat (*Rhinolophus hipposideros*) Version 1. Conservation Objectives Supporting Document Series. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, Dublin, Ireland.

NRA (2008) Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Scheme

NRA (2009) Guidelines for the Assessment of Ecological Impacts of National Road Schemes.

Water status data available on http://www.epa.ie and http://www.wfdireland.ie

Wildlife Act 1976 and Wildlife (Amendment) Act 2000.

APPENDIX 1

PRELIMINARY CONSTRUCTION MANAGEMENT PLAN

Project

Knocknacarra District Centre, Rahoon, Galway

Report Title

Construction and Environmental Management Plan

Client

Glenveagh Properties PLC

INFRASTRUCTURE

DBFL CONSULTING ENGINEERS

Glenveagh Living

OCTOBER 2019

Document Control

Job Title: Knocknacarra District Centre, Rahoon, Galway.

Job Number: 180191

Report Ref: 180191-rep-004

Author: Fernando Szeliga

Date: October 2019

Distribution: Planning
Client
Architect
Planning Consultant
File

Revision	Issue Date	Description	Prepared	Reviewed	Approved
A	24/10/2019	Stage 3 SHD	FNS	NCG	DJR

DBFL Consulting Engineers

Dublin Office
Ormond House
Upper Ormond Quay
Dublin 7

Tel 01 4004000
Fax 01 4004050
Email info@dbfl.ie
Web www.dbfl.ie

Waterford Office
Unit 2
The Chandlery
1-2 O'Connell Street, Waterford

Tel 051 309500
Email info@dbfl.ie
Web www.dbfl.ie

CONTENTS

1.0 INTRODUCTION

1.1 This document is an initial Construction and Environmental Management Plan for the proposed works to develop a mixed-use development in Knocknacarra, Galway. It includes an outline description of the proposed works and how these works will be managed for their duration. It includes details of the Preliminary Construction Traffic Management Plan, refer to section 11.

1.2 This project is currently at planning stage and as such input form the contractor has not been incorporated into the plan. On appointment of a contactor this document will be issued to them to be further developed into their final construction stage management plan for the project. This plan is a live document and subject to change/updates

1.3 The outline plan seeks to demonstrate how works can be delivered in a logical, sensible and safe sequence with the incorporation of specific measures to mitigate the potential impact on people and the surrounding environment.

1.4 Nothing stated in this document shall supersede or be taken to replace the terms of the Contract or the detailed design description issued with the Contract tender or the conditions of planning. Similarly, the issues covered within this document may be amended or added to by the Main contractors or in accordance with their specific works proposals, sequencing and procedures.

1.5 All works must be carried out in accordance with the mitigation measures outlined in this document and with the construction mitigation measures from the EIAR included in Appendix B.

1.6 When read by the contractor, this document should be read carefully in conjunction with all drawings, specifications and survey information provided.

1.7 Any consequences that result through failure to implement measures in this construction plan, or inadequate development of this plan by the contractor are the responsibility of the contractor and not DBFL.

2.0 SITE DESCRIPTION & EXISTING CONDITIONS

2.1 The subject site is located to the North of the Western Distributor Road and is bounded to the west by the existing Gateway Retail Park, which is approximately 2.6 Km from Galway City Centre. The site's southern boundary immediately bounds an Aldi supermarket. The primary school Gaelscoil Mhic Amhlaigh is to the north and residential developments are to the east. Refer to Figure 2.1 for site location.

The site is approximately 2.43Ha and is currently greenfield, however a construction compound is located in the southern end.

The site is within the Specific Local Objective Area of 'Enterprise, Light Industry and Commercial' in the Galway City Council Development Plan 2017-2023.

Figure 2.1 -

2.2 The proposed development consists of the construction of 332 residential units up to 7 storeys with 2,667 m^2 of commercial space including a 174m^2 creche at ground floor level. The site will be dissected into Site 1 and Site 2 by the proposed diversion of the existing access road to the Gateway Retail Park, refer to Figure 2.1.

2.3 Full details of the proposed development are included in the drawings and documentation submitted with the associated planning application. In summary they consist of the following;

- Construction of a residential development consisting of 332 residential units up to 7 storeys;
- Construction of 2,667m^2 of retail units;
- Construction of a creche;
- External Hard / Soft Landscaping incorporating courtyards/podiums;
- Diversion of existing access road to Gateway Retail Park;
- Construction of a vehicular access to the proposed car park at ground floor level;
- Under podium car parking at ground floor level providing 85 car spaces;
- Provision of a total of 291 cycle stand spaces located at ground level, and 386 enclosed bicycle parking stands, located at ground level;
- Associated new site services and drainage including foul and surface water sewer connections;
- Associated landscaping surrounding the site.
- Change of use of underground void to 183 bay underground car park.

3.0 CONSTRUCTION PROGRAMME & PHASING

3.1 GENERAL

3.1.1 The project is currently at planning stage and subject to approval and detailed design. It is estimated that the works would be tendered in Q2 2020 followed by commencement of the works and an estimated site programme of 24 months.

3.1.2 The proposed development will be constructed in two phases as indicated in the proposed development phasing plan included in Appendix A. Site 2 and the proposed access road realignment will be constructed in Phase 01. The existing access road to the existing retail park will be kept open to traffic until the proposed road diversion is complete. The existing access road will be decommissioned in Phase 2 after the new road diversion is complete. Specific control measures will be implemented to fully segregate construction traffic from external pedestrian traffic such as a site marshal.

3.1.3 The proposed order of construction of key elements in each phase is as follows, however this is subject to detailed review by the Contractors at construction stage and specifics may require adjustment once the contractor has been appointed;

- Site Setup;
- Earthworks, including disposal of excess material to a licensed waste facility;
- Construction of substructure and services;
- Super Structure Frame to buildings in sequence;
- Roof and Façade finishes;
- External hard and soft landscaping;
- Internal fit out;

3.1.4 The Contractor shall communicate with the public, local residences and businesses adjacent the development. All parties shall be kept up to date during the construction period at all times.

3.1.5 A Traffic Management Plan (TMP) shall be issued to Galway City Council for approval prior to works commencing on site. The approved TMP and any revisions thereof shall be set up and implemented on site. All necessary signage shall be erected in the weeks prior to any works commencing along and on adjacent roads to the proposed development giving advance warning to traffic, pedestrians / members of the public. Every effort shall be made to minimise the impact of the above works on local residences and traffic.

3.1.6 All personnel shall be inducted and made familiar with Risk Assessments / Method Statements (RAMS) and Traffic Management Plans.

3.1.7 All site-specific safety rules shall be adhered to.

3.1.8 All plant operators to have appropriate CSCS training.

3.1.9 All personnel to have SOLAS Safe Pass training

3.1.10 Fire extinguishers and first aid supplies to be available in the work area.

3.1.11 All adjacent roadways will be maintained in clean condition at all times.

3.1.12 Appropriate PPE to be worn at all times.

3.1.13 Biometric turnstiles to be used to prevent unauthorised access to the site.

4.0 WORKING HOURS

4.1 Working hours will be strictly in accordance with the granted planning conditions with no works on Sundays or Bank Holidays. If work is required outside of these hours, written approval will be sought by the contractor from the Local Authority.

4.2 It is anticipated that normal working hours may be 7am to 7pm Monday to Friday and 8am to 5pm on a Saturday. Working outside these hours will be subject to agreement with the Local Authority.

4.3 Deliveries of material to site will be planned to avoid high volume periods. There may be occasions where it is necessary to have deliveries within these times. The Contractor will develop, agree and submit a detailed Traffic Management Plan for the project prior to commencement.

5.0 SITE SETUP

5.1 The proposed site access is via Gort Na Bró, which can be accessed from the roundabout to the east of the subject site on the Western Distributor Road. The existing access road to the existing retail park shall be kept open to traffic until the proposed road diversion is fully completed. Specific control measures will be implemented to fully segregate construction traffic from external pedestrian traffic such as a site marshal.

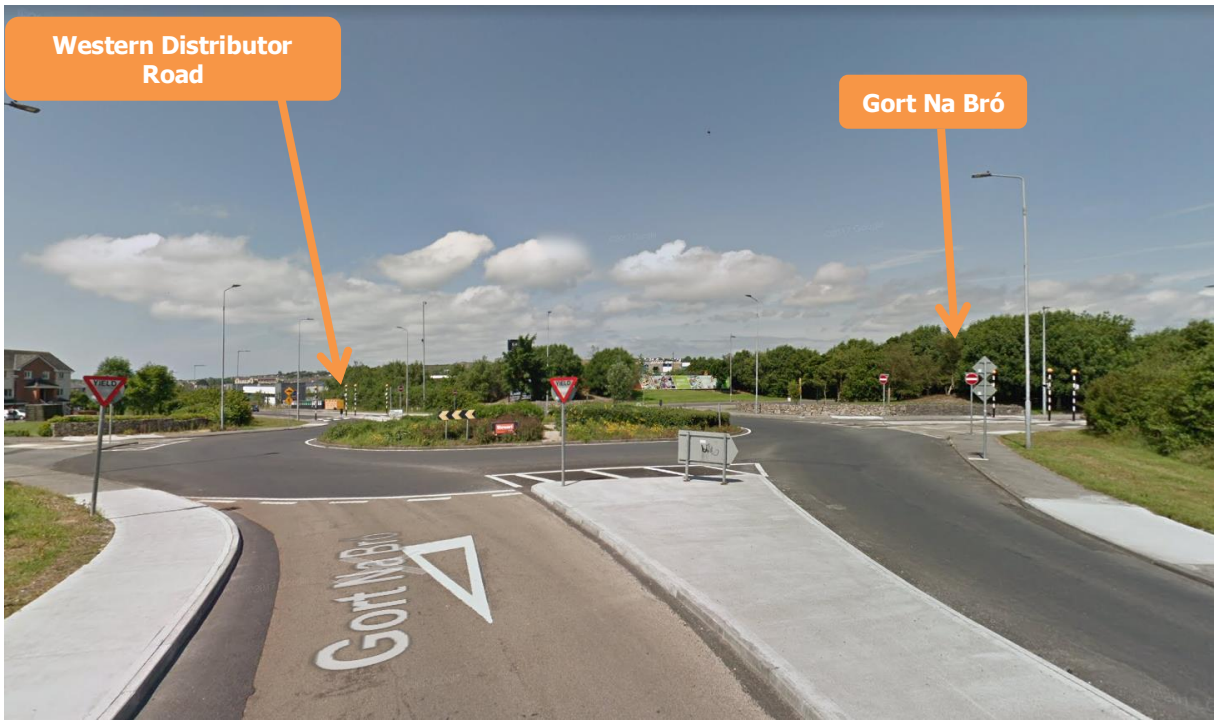


Figure 7.1: Proposed Vehicle Entrance

5.2 The proposed site access is detailed in Figure 7.1 and 7.2. The Contractor shall provide arrangements to provide for vehicular traffic to the site with control measures where crossing the public footpath. The proposed location of the Contractor compound will be internally within the site for the initial stages, but an external site compound may be required as works progress.

5.3 Immediately after access to the site is made and it is secure, the site compound will be established. Existing site services will be isolated including the decommissioning of any existing power supplies in conjunction with the ESB and the provision of a temporary builders power supply.

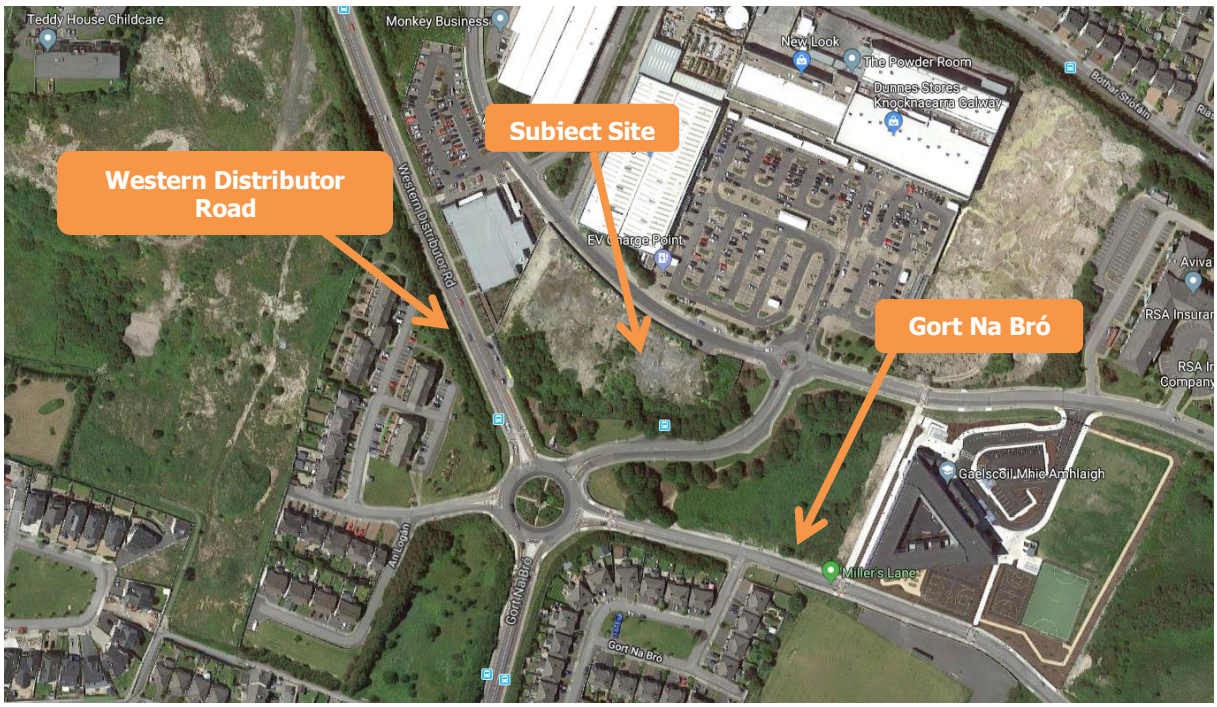


Figure 7.2: Proposed Vehicle Entrance Plan

5.4 The site will be secured with painted timber hoarding circa 2.4m high including supports and appropriate anchoring (Designed by Temporary Works Engineer), external lighting and Safety signage. Site hoarding will include Health and Safety warnings at appropriate intervals.

5.5 Site security will be provided by way of a monitored infrastructure systems such as site lighting and CCTV cameras, when deemed necessary.

6.0 DUST & DIRT GENERATION

6.1 The Contractor shall put in place a regime for monitoring dust levels in the vicinity of the site during the works. The level of monitoring and adoptions of mitigation measures will vary throughout the construction works depending on the type of activities being undertaken and the prevailing weather conditions at the time.

6.2 The minimum criteria to be maintained shall be the limit for Environmental Protection Agency (EPA) specification for licensed facilities in Ireland, which is 350mg/m2/day.

6.3 The Construction team will monitor the contractor's regime on an ongoing basis throughout the project to endeavour to minimise impact on a surrounding community.

6.4 If dust levels become an issue, then all dust generating activities on site will cease until such time as weather conditions improve (e.g. wind levels drop or rain falls) or mitigation measures such as damping down of the ground are completed.

6.5 During peak vehicle movements, where there is a likelihood of dirt on construction vehicles exiting the site, a dedicated road sweeper will be put in place until these works are competed.

6.6 If dirt generation extends onto public roads, road sweeping will be carried out as well, including if necessary cleaning of silt from road gullies.

6.7 Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind. Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods. Material stockpiles containing fine or dusty elements shall be covered with tarpaulins. Aggregates will be transported to and from the site in covered trucks.

6.8 Where drilling or pavement cutting, grinding or similar types of stone finishing operations are taking place, measures to control dust emissions will be used to prevent unnecessary dust emissions by the erection of wind breaks or barriers. All concrete cutting equipment shall be fitted with a water dampening system.

6.9 A complaints log shall be maintained by the construction site manager and in the event of a complaint relating to dust nuisance, an investigation shall be initiated.

6.10 A dedicated road sweeper shall be put in place during peak vehicle movements.

6.11 Site roadways shall be maintained in a stoned hardcore condition not allowing soil to accumulate that may create dust.

6.12 Wheel wash equipment shall be set up at the site exit gate for all construction vehicles to pass through prior to leaving the site thus ensuring that no dirt etc. is transported outside the site onto the roadways.

7.0 WASTE MANAGEMENT

7.1 The treatment of waste is to be employed by the contractor or a specialist waste management contractor as a trade package. This contractor is responsible for:

- Ensuring the site is kept clean and safe
- The collection of waste from a central point
- Segregation of waste on site.

7.2 The waste management contractor shall ensure that all access routes, fire escapes and staircases are swept and kept clear of debris on a regular basis to maintain high standards of health and safety on the project. No fires will be permitted on site.

7.3 The contractor shall adhere to the Construction and Demolition Waste Management Plan (CDWMP) for the project to ensure that all material is disposed of at an appropriately licensed land fill site.

7.4 The Contractor shall ensure maximum recycling, reuse and recovery of waste with diversion from landfill, wherever possible.

7.5 In order to ensure appropriate segregation of waste on site, a material storage zone shall be provided in the compound area. This storage zone will include material recycling areas and facilities. A series of ‘way finding’ signage will be provided to route staff and deliveries into the site and to designated compound or construction areas, as appropriate.

8.0 INVASIVE SPECIES

8.1 The following control measures are proposed the mitigate risk of spreading invasive species, such as Japanese Knotweed, Himalayan Knotweed, Himalayan Balsam, Gunnera, and Giant Hogweed:

8.1.1 All earthworks machinery shall be thoroughly pressure-washed prior to arrival on site and prior to their further use elsewhere.

8.1.2 Care should be taken not to disturb or cause the movement of invasive species fragments, either intentionally or accidentally.

8.1.3 There are not believed to be any existing stands of invasive species on site, but should any be found, they should be clearly demarcated by temporary fencing and tracking within them should be strictly avoided. A minimum buffer of seven metres should be applied to avoid disturbance of lateral rhizomes.

8.1.4 If any excavations must be carried out in areas of Japanese Knotweed, the excavated material should not be moved from the location. The machinery must be thoroughly pressure-washed in a designated area at least 25 metres from any watercourse before moving on to an area that is not yet infected.

8.1.5 All contractors and staff should be briefed about the presence, identification and significance of Japanese Knotweed before commencement of works.

8.1.6 Good construction site hygiene should be employed to prevent the spread of these species with vehicles thoroughly washed prior to leaving any site with the potential to have supported invasive species. All plant and equipment employed on the construction site (e.g. excavator, footwear, etc.) should be thoroughly cleaned down using a power washer unit prior to arrival on site to prevent the spread of invasive plant species such as Japanese Knotweed and Rhododendron. All washing must be undertaken in areas with no potential to result in the spread of invasive species.

8.1.7 When working at locations in proximity to natural watercourses, a suitable barrier should be erected between the watercourse and the stand of invasive species. This will assist in preventing the spread of any invasive species into the watercourse during their removal. There are no watercourses on the proposed development site, but cognizance should be had of any watercourses on neighbouring sites.

8.1.8 Any material that is imported onto any site to be verified by a suitably qualified ecologist to be free from any invasive species listed on the 'Third Schedule' of Regulations 49 & 50 of Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011). This will be carried out by searching for rhizomes and plant material.

8.1.9 Any soils or subsoils contaminated with invasive species will be sent for disposal to an authorized waste facility.

8.1.10 The treatment and control of invasive alien species will follow guidelines issued by the National Roads Authority – The Management of Noxious Weeds and Non-native Invasive Plant Species on National Roads (NRA 2010) and the Environment Agency (2013) – The Knotweed Code of Practice: Managing Japanese Knotweed on Development Sites (Version 3, amended in 2013).

9.0 NOISE & VIBRATION

9.1 It is not envisaged that any significant prolonged noise and vibration producing activities will be carried out on site.

9.2 The Contractor shall ensure that the level of noise and vibration resulting from the construction of the works does not constitute a nuisance, and that noise and vibration emissions conform to the requirements of BS 5228: 2009 Code of Practice for Noise and Vibration Control on Construction Sites, Part 1 and Part 2. All plant shall be adequately silenced to conform to the requirements of BS 5228.

9.3 Short-term vibration levels and continuous vibration guideline levels as measured in buildings shall be less that the guideline values in BS 5228.

9.4 Vibration limits to be applied for infrastructure works are those specified in the NRA document Guidelines for the Treatment of Noise and Vibration in National Road Schemes (NRA, Revision 1, 2004). Allowable vibration (in terms of peak particle velocity) at the closest part of sensitive property to the source of vibration, at a frequency of;

Allowable vibration velocity (Peak Particle Velocity) at the closest part of any sensitive property to the source of vibration, at a frequency of		
Less than 10Hz	10 to 50Hz	50 to 100Hz (and above)
8 mm/s	12.5 mm/s	20 mm/s

Table 2: Allowable vibration during road construction in order to minimise the risk of building damage

9.5 If significant noise and vibration activities are to be carried out on site, the contractor will ensure that there is prior liaison with other resident / local business etc. with a view to ensuring that excess noise is not generated by the works beyond the site curtilage and that contract details are available along with agreed protocols.

9.6 Contractor to use the Best Management Practice and mitigation measures to prevent or minimise noise levels from the works through the provision and proper maintenance, use and operation of all machinery. Contractor shall operate in accordance with the Safety, Health and Welfare at Work (General Application) Regulations 2007, part 5 Noise and Vibration.

9.7 The contractor shall appoint a designated person to manage all environmental complaints including noise. A noise complaint procedure shall be implemented in which

the details of any noise related complaint are logged, investigated and where required, measures are taken to ameliorate the source of the noise complaint. A strictly enforced noise management programme shall be implemented at the site from the outset of construction activities.

9.8 Appropriate signage shall be erected in the vicinity of the site to inform HGV drivers that engines shall not be left idling for prolonged periods and that the use of horns shall be banned at all times. HGV's queuing on any local or public road shall not be permitted and it shall be the responsibility of site management to ensure this policy is enforced.

9.9 All onsite generator units (if required) used to supply electricity to the site shall be super silenced or enclosed and located away from any receptor.

9.10 The principal of controlling noise at source shall be implemented at the site. Best practice mitigation techniques as specified in *BS 5228:2009+A1 2014 – Noise and Vibration Control on Construction and Open Sites* shall be implemented during the construction phase and are detailed in this Section.

9.11 Construction operations shall be confined to the period Monday-Friday 0700-1900 h, and Saturday 08:00-17:00 h.

9.12 Plant used onsite during the construction phase shall be maintained in a satisfactory condition and in accordance with manufacturer recommendations. In particular, exhaust silencers shall be fitted and operating correctly at all times. Defective silencers will be immediately replaced.

9.13 Where it is proposed to operate plant during the period 0700-0800 h, standard 'beeper' reversing alarms shall be replaced with flat spectrum alarms.

9.14 Solid barriers (hoarding) shall be erected to site boundary

10.0 POLLUTION CONTROL

10.1 Contamination of drainage systems and ground water is a risk during the construction phase. Detailed construction method statements will need to be approved by the client's design team.

10.2 Identified risks include spillages into drainage systems and unprotected ground, allowing pollutants to enter watercourses or ground water. The measures proposed to be put in place to mitigate this risk would be the use of exclusion zones around drainage systems where practicable.

10.3 Sediment and Erosion – Similar to the above, adjacent drainage systems/groundwater need to be protected from sedimentation and erosion due to direct surface water runoff generated onsite during the construction phase. To prevent this from occurring surface water discharge from site will be managed and controlled for the duration of the construction works until the permanently surface water drainage system of the proposed site is complete.

A temporary drainage system shall be installed prior to the commencement of the construction works to collect surface water runoff from the site during construction.

10.4 All works shall be undertaken in accordance with the CIRIA document, 'Control of Water Pollution from Construction Sites, guidance for consultants and contractors',

10.5 Accidental Spills and Leaks – All oils, fuels, paints and other chemicals will be stored in a secure bunded construction hardstand area. Refueling and servicing of construction machinery will take place in a designated hardstand area which is also remote from any drainage systems. A response procedure will be put in place to deal with any accidental pollution events and spillage kits will be available and construction staff will be familiar with the emergency procedures and use of the equipment.

10.6 Concrete – Concrete batching will take place off site, wash down and wash out of concrete trucks will take place off site and any excess concrete is not to be disposed

of on site. Pumped concrete will be monitored to ensure there is no accidental discharge. Mixer washings are not to be discharged into surface water drains/sewers.

10.7 Disposal of Wastewater from Site – Discharge from any vehicle wheel wash areas is to be directed to on-site settlement tanks/ponds, debris and sediment captured by vehicle wheel washes are to be disposed off-site at a licensed facility.

Foul drainage discharge from the construction compound will be tankered off site to a licensed facility until a connection to the public foul drainage network has been established.

11.0 CONSTRUCTION TRAFFIC

11.1 GENERAL SITE ACCESS / EGRESS

11.1.1 Construction traffic will be predominantly via the Western Distributor Road roundabout to the east of the site. By necessity it will entail traversing the existing estate roads which will be maintained by the Contractor for the duration of the works. Warning signage will be provided for pedestrians and other road users on all approaches in accordance with Chapter 8 of the Traffic Signs Manual and the Contractor's Traffic Management Plan.

11.1.2 As part of the Construction Stage Safety Plan for the works a Traffic Management Plan (TMP) will be prepared in accordance with the principles outlined below and held on site. It shall comply at all times with the requirements of;

- Chapter 8 of the Department of the Environment Traffic Signs Manual, current edition, published by The Stationery Office, and available from the Government Publications Office, Sun Alliance House, Molesworth Street, Dublin 2;
- Guidance for the Control and Management of Traffic at Road Works (June 2010) prepared by the Local Government Management Services Board;
- Any additional requirements detailed in the Design Manual for Roads and Bridges & Design Manual for Urban Roads & Streets (DMURS)

11.1.3 During the construction of the proposed infrastructure works, any unsuitable material or unusable material will be disposed offsite to a suitably licensed landfill facility in accordance with the regulations for same and the project Construction Waste Management Plan.

11.1.4 Construction traffic will consist of the following categories:

- Private vehicles owned and driven by site construction and supervisory staff.
- Excavation plant, dumper trucks and materials delivery vehicles involved in site development works.

11.1.5 The location of the vehicular entrance and access will be regularly reviewed during the construction to ensure that the pedestrian and vehicular access points are located and maintained appropriately.

11.2 STAFF AND PARKING

11.2.1 The site is readily accessible by bus services within nearby walking distance. On-site employees will generally arrive before 07:00, thus avoiding the morning peak hour traffic. Construction employees will generally depart after 17:00. It should be noted that a large proportion of construction workers may arrive in shared transport.

11.2.2 Construction traffic will not be permitted to park on the public roads or within the general area outside the main site. Restricted parking facilities will be provided by the contractor.

11.3 ON SITE ACCOMODATION

11.3.1 Facilities will be provided by the contractor as follows;

- Adequate materials drop-off and storage area;
- Set down areas for trucks;
- Dedicated staff parking and visitor parking; at an external location to be confirmed by the contractor.
- Staff welfare facilities i.e. toilets etc.

11.4 CONSTRUCTION ACTIVITIES

11.4.1 The most onerous construction period with regards to traffic generation is expected to be HGVs during the following work elements;

- Excavation stage where waste and soil is removed from site;
- Bringing construction materials to site;
- Bringing concrete to site for Sub and Superstructure.

11.5 MINIMISATION OF MOVEMENT AND IMPACT

11.5.1 Construction vehicle movements and their impact will be minimised through;

- Consolidation of delivery loads to / from the site and management of large deliveries on site to occur outside of peak periods;
- Use of precast / prefabricated materials where possible;
- Adequate storage space on site to be provided where possible;
- Scheduling of movements to outside peak traffic times and school pick-up / drop-off times.

11.5.2 All vehicles to switch off engines when not in use – no idling vehicles

11.5.3 Vehicle cleaning and wheel washing to take place on leaving site.

11.5.4 On-road vehicles to comply to set emission standards.

11.5.5 All non-road mobile machinery (NRMM) to be fitted with appropriate exhaust system and be regularly serviced.

11.5.6 Haul routes to be hard surfaced and cleaned and appropriate speed limits applied around the site.

11.5.7 The aggregates required for the construction of the proposed development will be sourced, as much as is possible and practicable, from quarries and suppliers located as near as possible to the proposed development. This will reduce the potential for any negative impacts associated with the haulage of the materials to the site of the proposed development. Existing soils and subsoils located on the site will be used where possible to reduce the amount of such materials required for import onto the site.

11.6 PUBLIC ROADS

11.6.1 The following measures will be taken to ensure that the site and surroundings are kept clean and tidy;

- A regular programme of site tidying to be established to ensure a safe and orderly site;
- Mud spillages on roads and footpaths outside the site to be cleaned regularly and will not be allowed to accumulate;
- Dedicated road sweeper will be put in place if site conditions require.

Appendix A

PHASING PLAN

CLUCH ARD

BOTHAR STIOF AIN

GATEWAY RETAIL PARK
PHASE 02
UNDER CONSTRUCTION

GATEWAY RETAIL PARK
PHASE 01

GAEL SCOIL
MHIC AMHLAIGH

SPORTS GROUND

BOTHAR STIOF AIN

GATEWAY RETAIL PARK
PHASE 01

GURT NA BRÓ

Future District
Centre Use

Proposed N6
Alignment Works
Road Boundary

WESTERN DISTRIBUTOR ROAD

ORIGINAL SHEET SIZE = A1

NOTES

ALL LEVELS ARE GIVEN IN METRES AND ARE REFERRED TO O.S. DATUM MALIN HEAD CO. DONEGAL (1970 ADJUSTMENT)

NORTH

KEY

- SITE OF PLANNING APPLICATION OUTLINED IN RED 3.00 Ha
- GATEWAY RETAIL PARK PHASE 02 - PLANNING REF: 17/158 UNDER CONSTRUCTION
- PHASE 01 - NEW LINK ROAD, SIGNALISED JUNCTION & ROAD WIDENING CONSTRUCTED. NORTHERN PORTION OF SITE CONSTRUCTED.
- PHASE 02 - EXISTING LINK ROAD REMOVED. BASEMENT CHANGE OF USE & REMAINING ROAD WORKS COMPLETED. SOUTHERN PORTION OF SITE CONSTRUCTED.

Glenveagh
Living

REV	DTE	DRN	ISSUE
A	OCT 2019	OM	STAGE 03 APPLICATION

reddy architecture+urbanism
Reddy Architecture + Urbanism
Dublin Office,
Clarity Mills, Clarity Road, Dublin 6.
T: +353 (0)1 4987000
W: www.reddyarchitecture.com
E: info@reddyarchitecture.com

FOR PLANNING

JOB
KNOCKNACARRA DISTRICT CENTRE,
RAHOON, GALWAY

CLIENT
GLENVEAGH LIVING

DRAWING
PHASING

DATE	OCT 2019	SCALE	1:500@ A0
DRN.	O.MORGAN	CHECKED	M.FREANEY

JOB NO.	DWG NO.	REVISION
18-179	18-179_1016	A

Appendix B

EIAR CONSTRUCTION MITIGATION MEASURES

14. SCHEDULE OF MITIGATION

14.1 Introduction

This section of the Environmental Impact Assessment Report (EIAR) provides a schedule of mitigation measures which are taken from all previous chapters of the EIAR. It is provided in an easily viewed table (Table 14.1). Further detail and background information is provided in the relevant EIAR Section.

Table 14-1 Proposed Mitigation Measures

Ref. No.	Reference Heading	Location	Mitigation Measure
Construction Phase			
Construction Management			
MM10	Operating hours	EIAR Section 4	Construction operations will in general be confined to the period Monday-Friday 0700-1900 h, and Saturday 08:00-17:00 h.
MM11	Health and Safety	EIAR Section 4	› A site-specific Health and Safety Plan will be in place for the proposed facility. All site staff will be made aware of and adhere to the company Health and Safety Plan. › Operate a Site Induction Process for all site staff, › Ensure all site staff will have current 'Safe Pass' cards, › Install adequate site hoarding to the site boundary, › Maintain Site Security staff at all times, › Install access security in the form of turn-styles and gates for staff, › Separate public pedestrian access from construction vehicular access, › Only appropriately qualified and trained personnel will be permitted to operate machinery onsite. › Appropriate barriers and signage will be used. › The proposed development site will not be accessible to members of the public. › The site will also be secure to prevent the risk of trespass through signage and provision of barriers.
MM12	Road Cleaning and Wheel Wash	EIAR Section 3	The Contractor will make provision for the cleaning by road sweeper etc. of all access routes to and from the site during the course of the works as required. It is intended that cleaning will be undertaken as required. A wheel wash facility will be provided on site to clean site traffic leaving the site. Waste water generated at this washing facility will be suitably treated on site and all settled silts disposed offsite to licensed landfill. All road sweeping vehicles will be emptied off site at a suitably licensed facility as per our construction stage environmental waste management document.
MM13	Wastewater Management	EIAR Section 3	Portable toilets will be provided for the working on the construction site. Wastewater arising on-site from these toilets is stored in a sealed tank located within the portable toilets, and these will be emptied

			periodically (as required) by permitted waste contractors and transported to municipal wastewater treatment plants for treatment..
MM14	Water Supply	EIAR Section 3	Water will be supplied on site by water tankers for general use. Potable water will be provided in the form of bottled water for staff use.
MM15	Site Signage	EIAR Section 4	Temporary warning signs and Hoarding will be provided along the site frontage to protect pedestrians using the footpaths.
MM16	Other Services	EIAR Section 12	The contractor must comply with and standard construction codes of practice in relation to working around electricity, gas, water, sewage and telecommunications networks.
Drainage Design and Management			
MM17	Hydrocarbons	EIAR Section 6, CEMP Section 8	› All plant and machinery will be serviced before being mobilised to site; › No plant maintenance will be completed on site, any broken down plant will be removed from site to be fixed; › Refuelling will be completed in a controlled manner using drip trays at all times; › Mobile bowsers, tanks and drums will be stored in secure, impermeable storage areas away from open water; › Fuel containers will be stored within a secondary containment system, e.g. bunds for static tanks or a drip tray for mobile stores; › Containers and bunding for storage of hydrocarbons and other chemicals will have a holding capacity of 110% of the volume to be stored; › Ancillary equipment such as hoses and pipes will be contained within the bund; › Taps, nozzles or valves will be fitted with a lock system; › Fuel and chemical stores including tanks and drums will be regularly inspected for leaks and signs of damage; › Drip-trays will be used for fixed or mobile plant such as pumps and generators in order to retain oil leaks and spills; › Only designated trained operators will be authorised to refuel plant on site; › Procedures and contingency plans will be set up to deal with emergency accidents or spills; and, › An emergency spill kit with oil boom, absorbers *etc.* will be kept on-site for use in the event of an accidental spill. A specific team of staff will be trained in the use of spill containment. › Highest standards of site management will be maintained and utmost care and vigilance followed to prevent accidental contamination or unnecessary disturbance to the site and surrounding environment

			during construction. A named person will be given the task of overseeing the pollution prevention measures agreed for the site to ensure that they are operating safely and effectively.
MM19	Concrete Deliveries and Management	EIAR Section 7	No batching of wet-cement products will occur on site. Ready-mixed supply of wet concrete products will be used and where possible
MM20	Concrete Deliveries and Management	EIAR Section 7	No washing out of any plant used in concrete transport or concreting operations will be allowed on-site
MM21	Concrete Deliveries and Management	EIAR Section 7	Where concrete is delivered on site, only the chute need be cleaned, using the smallest volume of water possible. No discharge of cement contaminated waters to the construction phase drainage system or directly to any artificial drain or watercourse will be allowed. Chute cleaning water is to be directed into a dedicated lined washout area. This lined area will be removed from site once the construction phase is complete;
MM22	Concrete Deliveries and Management	EIAR Section 7	Weather forecasting will be used to plan dry days for pouring concrete. Ensure pour site is free of standing water and plastic covers will be ready in case of sudden rainfall event
MM23	Silt Fences	EIAR Section 7	Silt fences will be placed up-gradient of all drains where construction is proposed. Silt fences are effective at removing heavy settleable solids. This will act to prevent entry to watercourses of sand and gravel sized sediment, released from excavation of mineral sub-soils of glacial and glacio-fluvial origin, and entrained in surface water runoff.
MM24	Surface Water	EIAR Section 7	› Collection and treatment of surface water within the site will be completed using perimeter swales at low points around the construction areas, and if required water will be pumped from the swales into sediment bags prior to overland discharge allowing water to percolate naturally to ground or disperse by diffuse flow into local drainage ditches; › Discharge onto ground will be via a silt bag which will filter any remaining sediment from the pumped water. The entire discharge area from silt bags will be enclosed by a perimeter of double silt fencing; › Any proposed discharge area will avoid potential surface water ponding areas, and will only be located where suitable subsoils are present; › No pumped construction water will be discharged directly into any local watercourse;

MM26	Silt Bags	EIAR Section 7	Silt bags will be used where small to medium volumes of water need to be pumped from excavations or swales. As water is pumped through the bag, most of the sediment is retained by the geotextile fabric allowing filtered water to pass through. Silt bags will be used with natural vegetation filters.
Peat, Subsoils and Bedrock			
MM28	Excess material	EIAR Section 6	Construction of service trenching, pumping station and surface water attenuation features will generate excess material. All excess material will be sent to an authorised soil and stone or waste recovery facility
Flora and Fauna			
MM29	Replanting	EIAR Section 5	A landscape plan has been developed for the site. The planting schedule will include the native trees Scots pine (*Pinus sylvestris*), oak (*Quercus robur*), silver birch (*Betula pendula*), strawberry tree (Arbutus unedo) and wild cherry (Prunus avium). Specimen semi mature tree planting along the site boundary will include oak (*Quercus robur*) and silver birch (*Betula pendula).* Planting within the amenity areas will include the following pollinator friendly species as recommended in the Pollinator friendly planting code (All Ireland Pollinator Plan 2015-2020) – Allium sp., Lavandula angustifolia (English lavender), Rosmarinus officinalis (Rosemary), Salvia sp., Mahonia sp. Such measures will maintain the local biodiversity in the area.
	Birds	EIAR Section 5	Vegetation clearance will be undertaken in line with the provisions of the Wildlife Acts (As Amended), 1976-2017.
	Bats	EIAR Section 5	The proposed landscape plan will maintain foraging and commuting habitat for bats.
Noise			
MM32	Construction Noise	EIAR Section 8 CEMP Section 6	› Plant and machinery with low inherent potential for generation of noise and/or vibration will be selected. All construction plant and equipment to be used onsite will be modern equipment and will comply with the European Communities (Construction Plant and Equipment) (Permissible Noise Levels) Regulations. › Site compounds should be located away from noise sensitive boundaries within the site constraints. The use lifting bulky items, dropping and loading of materials within these areas should be restricted to normal working hours. › For mobile plant items such as cranes, dump trucks, excavators and loaders, maintaining enclosure panels closed during operation can reduce noise levels over normal operation. › Mobile plant should be switched off when not in use and not left idling.

			› For percussive tools such as pneumatic breakers, a number of noise control measures include fitting muffler or sound reducing equipment to the breaker 'tool' and ensure any leaks in the air lines are sealed. Erect localised screens around breaker or drill bit when in operation in close proximity to noise sensitive boundaries. › For concrete mixers, control measures will be employed during cleaning to ensure no impulsive hammering is undertaken at the mixer drum. › For all materials handling drop heights will be minimized. Drop chutes and dump trucks will be lined with resilient materials. › Compressors, generators and pumps will be surrounded by acoustic lagging or enclosed within acoustic enclosures providing air ventilation. › All items of plant should be subject to regular maintenance. Such maintenance can prevent unnecessary increases in plant noise and can serve to prolong the effectiveness of noise control measures. › Site well be screened withtandard construction site hoarding (2.4m in height) with a mass per unit of surface area greater than 7 kg/m2 to provide adequate sound insulation. › A designated noise liaison officer will appointed to site during construction works. Any noise complaints will be logged and followed up in a prompt fashion by the liaison officer. In addition, prior to particularly noisy construction activity, e.g. piling, the liaison officer will inform the nearest noise sensitive locations of the time and expected duration of the noisy works.
Air Quality/Dust			
MM33	Air Quality	EIAR Section 4, 8.	› All construction vehicles and plant will be maintained in good operational order while onsite, thereby minimising any emissions that arise. › Mobile plant should be switched off when not in use and not left idling.
MM34	Dust Suppression	EIAR Section 3, 4, 8 CEMP Section 5	› Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind. Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods. Material stockpiles containing fine or dusty elements shall be covered with tarpaulins. Aggregates will be transported to and from the site in covered trucks. › If dust levels become an issue, then all dust generating activities on site will cease until such time as weather conditions improve (e.g. wind levels drop or rain falls) or mitigation measures such as damping down of the ground are completed. › Site road ways will be maintained in a stoned hard core condition not allowing soil to accumulate which when dry can create dust.

			› Wheel wash equipment will be set up at the site exit gate for all construction vehicles to pass through prior to leaving the site thus ensuring that no dirt etc. is transported outside the site onto the roadways. › Plant and equipment that have the potential to create volumes of dust will have appropriate attachments to allow water source to dampen dust to not allow it to get airborne. › By the use of barriers such as debris netting on scaffolding around the building to block dust escaping where the building is within 10m of the site boundary where residential properties exist. › Where drilling or pavement cutting, grinding or similar types of stone finishing operations are taking place, measures to control dust emissions will be used to prevent unnecessary dust emissions by the erection of wind breaks or barriers. › All concrete cutting equipment shall be fitted with a water dampening system. During peak vehicle movements, where there is a likelihood of dirt on construction vehicles exiting the site, a dedicated road sweeper will be put in place until these works are competed. › Deploy Road Sweeper as required on External Roads.
Traffic			
MM35	Construction Traffic	EIAR Section 12 CEMP Section 9	› On-site employees will generally arrive before 07:00, thus avoiding the morning peak hour traffic. › Construction traffic will not be permitted to park on the public roads or within the general area outside the main site. Restricted parking facilities will be provided by the contractor. › Due to proximity of site to Gaelscoil Mhic Amhlaigh school the construction traffic adjacent to school will be limited to the outside of the school hours. Additionally, a temporary pedestrian/cycle routes will be required at the proposed site access locations to fully segregate construction traffic from pedestrian traffic. Site marshal will be provided especially during morning and afternoon school drop-off/pick-up times. › Construction vehicle movements and their impact will be minimised through; ○ Consolidation of delivery loads to / from the site and management of large deliveries on site to occur outside of peak periods; ○ Use of precast / prefabricated materials where possible; ○ Adequate storage space on site to be provided where possible; ○ The design of the works has involved an element of minimising the quantity of material to be removed from site by way of cut and fill balance; ○ Scheduling of movements to outside peak traffic times and school pickup / drop-off times

APPENDIX 2

ASSESSMENT OF EFFECTS ON SCIs AND QIs OF GALWAY BAY COMPLEX SAC AND INNER GALWAY BAY SPA

ASSESSMENT OF IMPACT ON TARGETS AND ATTRIBUTES QIS AND SCIS OF EU DESIGNATED SITES

1. IMPACT OF THE PROPOSED DEVELOPMENT ON THE RELEVANT SCIS OF INNER GALWAY BAY SPA.

Table 1.1: Impact of the proposed development on the conservation objectives of Wetlands [A999].

To maintain the favourable conservation condition of wetland habitat in Inner Galway Bay SPA as a resource for the regularly occurring migratory waterbirds that utilise it. This is defined by the following attribute and targets:			
Attributes	**Measure**	**Target**	**Assessment**
Habitat Area	Hectares	The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 13,267ha, other than that occurring from natural patterns of variation.	According to the site-specific conservation objective documents (NPWS, 2013), the wetland habitat area was estimated as 13,267ha. The footprint of the proposed development is outside the boundary of Inner Galway Bay SPA and therefore there will be no direct loss of wetland habitat as a result of the proposal. Indirect habitat loss as a result of deterioration in water quality was considered. Mitigation measures outlined in the CMP, ensure that any potential pathways for surface water pollution to this QI are robustly blocked.

			Construction best practice measures have been implemented into the construction phase of the development, as described in section 2.2 of the NIS and in the accompanying Construction Management Plan (CMP). Operational services, including all foul water will be connected to the local public sewer. All surface water runoff will discharge to existing surface water sewers. There will be no direct or indirect loss of *'Wetland'* habitat due to the proposal, and therefore no decline in distribution.

2. IMPACT OF THE PROPOSED DEVELOPMENT ON THE RELEVANT QI'S OF GALWAY BAY COMPLEX SAC

2.1.1 *Salicornia* Mud [1310]

Information on this habitat was gained from the NPWS (2013) The Status of EU Protected Habitats and Species in Ireland Habitat Assessments Volume 2. Version 1.1. Unpublished Report, National Parks & Wildlife Services. Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland; hereafter referred to as the NPWS Article 17 report.

> *'Salicornia and other annuals colonising mud and sand (1310)' is a pioneer saltmarsh community that may occur on muddy sediment seaward of established saltmarsh, or form patches within other saltmarsh communities where the elevation is suitable and there is regular tidal inundation.*
>
> *The Interpretation Manual of EU Habitats (Commission of the European Communities 2003) defines Salicornia and other annuals colonising mud and sand (1310) as annuals belonging mainly to the genus Salicornia that colonise periodically inundated muds and sands of marine or interior salt marshes and belong to the phytosociological classes: Thero-Salicornietea, Frankenietea pulverulentae and Saginetea maritimae. Only vegetation from the first and third class is known in the Republic of Ireland. There are several sub-types listed and four British National Vegetation Classification plant communities (Rodwell 2000) are listed: "SM7 Arthrocnemum perenne stands", "SM8 Annual Salicornia saltmarsh", "SM9 Suaeda maritima saltmarsh" and "SM27 Ephemeral saltmarsh vegetation with Sagina maritima". In Ireland, three sub-types are recognised: (1) Salicornia type (2) Suaeda type and (3) the much rarer Sagina type. Mono-specific swards of Salicornia spp. growing on muddy sediments are the most common plant community belonging to this Annex I habitat type found in Ireland*
>
> *The plant community "SM7 Arthrocnemum perenne stands" is characteristic of a different Annex I saltmarsh community; Mediterranean and thermo-Atlantic Halophilous scrubs (1420). This habitat has a very restricted distribution and area, and is not considered part of the 1310 Salicornia flats habitat.*
>
> *As this habitat is dominated by annuals it can be ephemeral or transient in nature and is highly susceptible to erosion. Its distribution can vary considerably from year to year and it can move in response to changing conditions, e.g. in estuaries with shifting river channels.*

The range and area of this habitat in Ireland has been assessed as **favourable** in the NPWS Article 17 Report.

The specific structures and functions (including species) and the future prospects for the habitat have both been assessed as **inadequate (declining)**. On the basis of the above, the overall assessment of conservation status is **inadequate (declining).**

Pressures:

- Invasive non-native species **(high importance)**
- Erosion **(medium importance)**
- Silting up **(medium importance)**
- Intensive cattle grazing **(high importance)**

- Diffuse pollution to surface waters due to household sewage and waste waters **(high importance)**
- Reclamation of land from sea, estuary or marsh **(medium importance)**
- Dykes, embankments, artificial beaches, general **(medium importance)**
- Walking, horseriding and non-motorised vehicles **(medium importance)**
- Intensive sheep grazing **(low importance)**
- Species composition change (succession) **(medium importance)**

Threats:

- Invasive non-native species **(high importance)**
- Erosion **(medium importance)**
- Silting up **(medium importance)**
- Intensive cattle grazing (high importance)
- Diffuse pollution to surface waters due to household sewage and waste waters **(medium importance)**
- Reclamation of land from sea, estuary or marsh **(medium importance)**
- Dykes, embankments, artificial beaches, general (medium importance)
- Walking, horseriding and non-motorised vehicles (medium importance)
- Intensive sheep grazing (low importance)
- Changes in abiotic conditions (high importance)
- Species composition change (succession) (medium importance)

Targets and attributes for the conservation of this habitat are available in the detailed Conservation Objectives for Galway Bay Complex SAC. These have been reviewed and considered in relation to the current development in Table 2.1.

Table 2.1: Impact of the proposed development on Salicornia and other annuals colonising mud and sand [1310] conservation objectives.

To maintain the favourable conservation condition of Salicornia and other annuals colonising mud and sand [1310] in Galway Bay Complex SAC, which is defined by the following list of attributes and targets:			
Attributes	**Measure**	**Target**	**Assessment**
Habitat Area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession.	According to the site-specific conservation objectives (NPWS, 2013) the full extent this habitat within Galway Bay Complex SAC is unknown and further unsurveyed areas may be present within the SAC. '*Salicornia* and other annuals colonising mud and sand (1310)' is a pioneer saltmarsh community that may occur on muddy sediment seaward of established saltmarsh, or form patches within other saltmarsh communities where the elevation is suitable and there is regular tidal inundation. This habitat does not occur within, or immediately adjacent to the site. There will be no direct loss of *Salicornia* habitat due to the proposal, and therefore no decline in distribution.
Habitat distribution	Occurrence	No decline, or change in distribution, subject to natural processes	
Physical structure: sediment supply.	Presence/absence of physical barriers.	Maintain/restore the natural circulation of sediment and organic matter, without any physical obstructions.	This habitat is generally found in the lower zone of the saltmarsh. The proposed development site is in excess

To maintain the favourable conservation condition of Salicornia and other annuals colonising mud and sand [1310] in Galway Bay Complex SAC, which is defined by the following list of attributes and targets:			
Attributes	**Measure**	**Target**	**Assessment**
Physical structure: creeks and pans	Occurrence	Maintain, or where necessary restore, creek and pan structure, subject to natural processes, including erosion and succession.	of 1.7km south-west of any mudflat habitat, that could have the potential to support *Salicornia [1310]* habitat within Galway Bay Complex SAC.
Physical structure: Flooding Regime	Hectares flooded; frequency	Maintain natural tidal regime.	
Vegetation composition: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.	The proposed development site is in excess of 1.7km from of any mudflat habitat. There will be no impact on the vegetation composition or structure of this habitat. According to the saltmarsh monitoring project (McCorry and Ryle, 2006) anthropogenic factors which may influence vegetation structure and composition include reclamation, drainage, pollution, vehicle tracks, peat-cutting, turf cutting, poaching and overuse, none of which will occur as a result of the proposed development.
Vegetation structure: Height	Centimetres	Maintain structural variation within the sward.	
Vegetation structure: vegetation cover	Percentage cover at a representative sample of monitoring stops	Maintain more than 90% of area outside creeks vegetated	
Vegetation composition: typical species and sub-communities	Percentage cover	Maintain the range of species-poor communities with typical species listed in SMP (McCorry and Ryle, 2009)	
Vegetation structure: negative indicator species – *Spartina anglica*	Hectares	There is currently no common cordgrass (*Spartina anglica*) in this SAC. Prevent establishment of cordgrass.	According to the site-specific conservation objectives (NPWS, 2013) there is currently no common cordgrass in this SAC. There will be no

To maintain the favourable conservation condition of Salicornia and other annuals colonising mud and sand [1310] in Galway Bay Complex SAC, which is defined by the following list of attributes and targets:			
Attributes	Measure	Target	Assessment
			introduction of cordgrass to the SAC, as a result of the proposed development.

2.1.2 Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330]

Information on this habitat was gained from the NPWS Article 17 report (NPWS, 2013). The habitat account in that document reads as follows:

> *Atlantic salt meadows generally occupy the widest part of the saltmarsh gradient. They also contain a distinctive topography with an intricate network of creeks and salt pans occurring on the medium to large sized saltmarshes. Atlantic salt meadows contain several distinctive zones that are related to elevation and submergence frequency. The lowest part along the tidal zone is generally dominated by common saltmarsh-grass (Puccinellia maritima) with species like glasswort (Salicornia spp.), annual sea-blite (Suaeda maritima) and lax-flowered sea-lavender (Limonium humile) also important. The invasive common cordgrass (Spartina anglica) can be locally abundant in this habitat. The mid marsh zones are generally characterised by thrift (Armeria maritima) and or sea plantain (Plantago maritima). This zone is generally transitional to an upper marsh herbaceous community with red fescue (Festuca rubra), saltmarsh rush (Juncus gerardii) and creeping bent (Agrostis stolonifera). This habitat is also important for other wildlife including wintering waders and wildfow. Atlantic salt meadows are distributed around most of the coastline of Ireland. The intricate topography of the Irish coastline with many inlets has created an abundance of sites that are sheltered and allow muddy sediments to accumulate, leading to the development of saltmarsh.*

Both the range and area of this habitat in Ireland has been assessed as **favourable** in the NPWS Article 17 Report.

The specific structures and functions (including species) and future prospects for the habitat have both been assessed as **inadequate (stable)** On the basis of the above, the overall assessment of conservation status is **inadequate** with the overall trend assessed as **stable**.

The main pressures and threats identified in the Article 17 report are listed below:

Pressures:

- Intensive cattle grazing **(high importance)**
- Intensive sheep grazing **(medium importance)**
- Paths, tracks, cycling tracks **(high importance)**
- Disposal of household/recreational facility waste **(low importance)**
- Other industrial/commercial area **(low importance)**
- Reclamation of land from sea, estuary or marsh **(low importance)**
- Polderisation **(low importance)**
- Modification of hydrographic functioning, general **(low importance)**
- Erosion **(medium importance)**
- Invasive non-native species **(medium importance)**

Threats:

- Intensive cattle grazing **(high importance)**
- Intensive sheep grazing **(medium importance)**
- Paths, tracks, cycling tracks **(high importance)**
- Disposal of household/recreational facility waste **(low importance)**
- Disposal of industrial waste **(low importance)**
- Reclamation of land from sea, estuary or marsh **(low importance)**

- Polderisation **(low importance)**
- Modification of hydrographic functioning, general **(low importance)**
- Erosion **(medium importance**)
- Invasive non-native species **(medium importance)**

Targets and attributes for the conservation of this habitat are available in the detailed Conservation Objectives for Galway Bay Complex SAC. These have been reviewed and considered in relation to the current development in Table 2.2.

Table 2.2: Impact of the proposed development on Atlantic salt meadows (Glauco-Puccinellietalia maritimae) conservation objectives.

To restore the favourable conservation condition of Atlantic Salt Meadows (Glauco-Puccinellietalia maritimae) [1330] in Galway Bay Complex SAC, which is defined by the following list of attributes and targets			
Attributes	**Measure**	**Target**	**Assessment**
Habitat Area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession.	According to the site-specific conservation objectives (NPWS, 2013) the full extent this habitat within Galway Bay Complex SAC is unknown and further unsurveyed areas may be present within the SAC. Atlantic salt meadows generally occupy the widest part of the saltmarsh gradient. They also contain a distinctive topography with an intricate network of creeks and salt pans occurring on the medium to large sized saltmarshes. Atlantic salt meadows contain several distinctive zones that are related to elevation and submergence frequency. This habitat does not occur within, or immediately adjacent to the site. The saltmarsh Monitoring Project mapped 12.36ha of potential Atlantic saltmarsh/Mediterranean Salt Meadow habitat in 2009, in excess of 1.7km south-west of the proposed development site.
Habitat distribution	Occurrence	No decline, or change in distribution, subject to natural processes	

To restore the favourable conservation condition of Atlantic Salt Meadows (Glauco-Puccinellietalia maritimae) [1330] in Galway Bay Complex SAC, which is defined by the following list of attributes and targets			
Attributes	**Measure**	**Target**	**Assessment**
			There will be no direct loss of Atlantic Salt Meadow habitat due to the proposal, and therefore no decline in distribution.
Physical structure: sediment supply.	Presence/absence of physical barriers.	Maintain/restore the natural circulation of sediment and organic matter, without any physical obstructions.	The processes that maintain the physical structures of this habitat including regular tidal inundation, flooding, sediment circulation and accretion will not be affected by the proposed development, as there will be no alteration of the flood regime or physical barrier affecting flooding.
Physical structure: creeks and pans	Occurrence	Maintain, or where necessary restore, creek and pan structure, subject to natural processes, including erosion and succession.	
Physical structure: Flooding Regime	Hectares flooded; frequency	Maintain natural tidal regime.	
Vegetation composition: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.	There will be no impact on the vegetation composition or structure of this habitat. According to the saltmarsh monitoring project (McCorry and Ryle, 2006) anthropogenic factors which may influence vegetation structure and composition include reclamation, drainage, pollution, vehicle tracks, peat-cutting, turf cutting, poaching and
Vegetation structure: Height	Centimetres	Maintain structural variation within the sward.	
Vegetation structure: vegetation cover	Percentage cover at a representative sample of monitoring stops	Maintain more than 90% of area outside creeks vegetated	

To restore the favourable conservation condition of Atlantic Salt Meadows (Glauco-Puccinellietalia maritimae) [1330] in Galway Bay Complex SAC, which is defined by the following list of attributes and targets			
Attributes	**Measure**	**Target**	**Assessment**
Vegetation composition: typical species and sub-communities	Percentage cover	Maintain the range of species-poor communities with typical species listed in SMP (McCorry and Ryle, 2009)	overuse, none of which will occur as a result of the proposed development.
Vegetation structure: negative indicator species – Spartina anglica	Hectares	There is currently no common cordgrass *(Spartina anglica*) in this SAC. Prevent establishment of cordgrass.	According to the site-specific conservation objectives (NPWS, 2013) there is currently no common cordgrass in this SAC. There will be no introduction of cordgrass to the SAC, as a result of the proposed development.

2.1.3 Mediterranean salt meadows (*Juncetalia maritimae*) [1410]

Information on this habitat was gained from the NPWS Article 17 report (NPWS, 2013). The habitat account in that document reads as follows:

> *Mediterranean salt meadows occupy the upper zone of saltmarshes and usually occur adjacent to the boundary with terrestrial habitats. They are widespread on the Irish coastline, however they are not as extensive as Atlantic salt meadows. The habitat is distinguished from Atlantic salt meadows by the presence of rushes such as sea rush (Juncus maritimus) and/or sharp rush (J. acutus), along with a range of species typically found in Atlantic salt meadows; including sea aster (Aster tripolium), sea purslane (Atriplex portulacoides), sea-milkwort (Glaux maritima), saltmarsh rush (J. gerardii), parsley water-dropwort (Oenanthe lachenalii), sea plantain (Plantago maritima) and common saltmarsh grass (Puccinellia* maritima).

The range and area of this habitat in Ireland has been assessed as **favourable** in the NPWS Article 17 Report.

The specific structures and functions (including species) and future prospects for the habitat have both been assessed as **inadequate (stable).** On the basis of the above, the overall assessment of conservation status is **inadequate** with the overall trend assessed as **stable**.

The main pressures and threats identified in the Article 17 report are listed below:

Pressures:

- Intensive cattle grazing **(high importance)**
- Paths, tracks, cycling tracks **(medium importance)**
- Erosion **(low importance)**
- Modification of hydrographic functioning, general **(low importance)**

Threats:

- Intensive cattle grazing **(high importance)**
- Paths, tracks, cycling tracks **(medium importance)**
- Erosion **(low importance)**
- Modification of hydrographic functioning, general **(low importance)**
- Infilling of ditches, dykes, ponds, pools, marshes or pits **(low importance)**

Targets and attributes for the conservation of this habitat are available in the detailed Conservation Objectives for Galway Bay Complex SAC. These have been reviewed and considered in relation to the current development in Table 2.3

Table 2.3: Impact of the proposed development on Mediterranean salt meadows (Juncetalia maritimi) conservation objectives.

To restore the favourable conservation condition of Mediterranean salt meadows (Juncetalia maritimi) in Galway Bay Complex SAC, which is defined by the following list of attributes and targets:			
Attributes	**Measure**	**Target**	**Assessment**
Habitat Area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession.	According to the site-specific conservation objectives (NPWS, 2013) the total estimated area of this habitat within Galway Bay Complex SAC is 19.887ha and further unsurveyed areas may be present within the SAC. Mediterranean salt meadows occupy the upper zone of saltmarshes and usually occur adjacent to the boundary with terrestrial habitats. This habitat does not occur within, or immediately adjacent to the site. The nearest known mapped example of this habitat is located at Rusheen Bay, approximately 1.97km downstream (surface water distance) of the proposed development site, surveyed as part of the saltmarsh monitoring project 2007-2008. There will be no direct loss of *Mediterranean Salt Meadow* habitat due to the proposal, and therefore no decline in distribution.
Habitat distribution	Occurrence	No decline, or change in distribution, subject to natural processes	

To restore the favourable conservation condition of Mediterranean salt meadows (Juncetalia maritimi) in Galway Bay Complex SAC, which is defined by the following list of attributes and targets:			
Attributes	**Measure**	**Target**	**Assessment**
Physical structure: sediment supply.	Presence/absence of physical barriers.	Maintain/restore the natural circulation of sediment and organic matter, without any physical obstructions.	The processes that maintain the physical structures of this habitat including regular tidal inundation, flooding, sediment circulation and accretion will not be affected by the proposed development, as there will be no alteration of the flood regime or physical barriers affecting flooding.
Physical structure: creeks and pans	Occurrence	Maintain, or where necessary restore, creek and pan structure, subject to natural processes, including erosion and succession.	
Physical structure: Flooding Regime	Hectares flooded; frequency	Maintain natural tidal regime.	
Vegetation composition: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.	There will be no impact on the vegetation composition or structure of this habitat. According to the saltmarsh monitoring project (McCorry and Ryle, 2006) anthropogenic factors which may influence vegetation structure and composition include reclamation, drainage, pollution, vehicle tracks, peat-cutting, turf cutting, poaching and overuse, none of which will occur as a result of the proposed development.
Vegetation structure: Height	Centimetres	Maintain structural variation within the sward.	
Vegetation structure: vegetation cover	Percentage cover at a representative sample of monitoring stops	Maintain more than 90% of area outside creeks vegetated	
Vegetation composition: typical species and sub-communities	Percentage cover at a representative sample of monitoring stops	Maintain the range of species-poor communities with typical species listed in SMP (McCorry and Ryle, 2009)	

To restore the favourable conservation condition of Mediterranean salt meadows (Juncetalia maritimi) in Galway Bay Complex SAC, which is defined by the following list of attributes and targets:			
Attributes	**Measure**	**Target**	**Assessment**
Vegetation structure: negative indicator species – Spartina anglica	Hectares	There is currently no common cordgrass *(Spartina anglica*) in this SAC. Prevent establishment of cordgrass.	According to the site-specific conservation objectives (NPWS, 2013) there is currently no common cordgrass in this SAC. There will be no introduction of cordgrass to the SAC, as a result of the proposed development.

2.1.4 Reefs [1170]

Information on this habitat was gained from the NPWS Article 17 report (NPWS, 2013). The habitat account in that document reads as follows:

Reef habitats are widespread marine features with immobile hard substrate available for colonisation by epifauna. Reef habitat in Irish waters ranges from the intertidal to 4500m below the sea surface and more than 400km from the coast.

Intertidal Reefs are familiar and widespread habitats characterised by hard rock washed by the tide. There are a number of factors that influence this habitat type including tidal immersion, influence of freshwater (riverine and rainwater), variation in temperature, desiccation, exposure to waves, stability of substrate, and weathering of substrate. With distance from the intertidal these parameters become less active in influencing the habitat.

Subtidal Reef is most often found in exposed areas with little influence of freshwater. In depths down to 30m along the Atlantic margin there is still a significant penetration of light and swell waves reach the reef. In depths below 30m (or shallower in some coastal areas) insufficient light penetrates to hard rock structures to allow photosynthesis of algae and the habitat usually becomes dominated by fauna.

In the offshore, hard rock structures occur intermittently between soft sediment, mostly along the shelf margin. In depths of several hundred meters no light reaches the bottom and temperatures are usually cool and fairly constant. A significant type of the Reef habitat is that generated by the habitat forming accretions of animals. These Biogenic Reefs increase the structural complexity beyond the surrounding areas and usually result in greater biodiversity. In the inshore these may be formed by the protective structures of worms or in the offshore by stony deep-water coral species.

Intertidal and subtidal Reefs are frequently dominated by algal species including: Ulva spp., Chaetomorpha spp., Fucus spp., Laminaria spp., Dictyota dichotoma, Corallina officinalis, Porphyra spp. Chondrus crispus, Mastocarpus stellatus, Delesseria sanguinea, Cryptopleura ramosa, Lomentaria articulata, Polysiphonia spp., Ceramium spp.). Near shore Reef species commonly include the invertebrate species of poriferans (Scypha ciliata, Grantia compressa, Halichondria panicea, Hymeniacidon perleve, Cliona stellata, Pachymatisma johnstonia, Dysidea fragilis), cnidarians (Nemertesia antennina, Halecium halecium, Anemonia viridis, Actinia equina, Sagartia elegans, Actinothoe sphyrodeta, Corynactis viridis, Alcyonium digitatum, Caryophyllia smithii, Metridium spp.), polychaetes (Sabellaria alveolata, Spirorbis spp. Pomatoceros triqueter), crustaceans (Balanus spp., Semibalanus balanoides, Carcinus maenas, Cancer pagurus, Necora puber, Pagurus bernhardus, Galathea spp.), molluscans (Gibbula spp, Littorina spp., Nucella lapillus, Patella spp., Calliostoma zizyphinum, Aplysia punctata, Mytilus edulis), bryozoans (Alcyonidium diaphanum), echinoderms (Antedon bifida, Echinus esculentus, Marthasterias glacialis, Holothuria forskali, Aslia lefevrei, Pawsonia saxicola), and tunicates (Botryllus schlosseri, Ascidia mentula, Dendrodoa grossularia). A range of fish species are also associated with this habitat including Pholis gunnellus, Lotidae spp., Nerophis lumbriciformis, Pollachius spp., Conger conger, Labridae spp.). Deepwater Reefs exhibit a range of species including scleractinian corals (Lophelia pertusa, Madrepora oculata, Solenosmilia variabilis, Flabellum spp. Desmophyllum dianthus), antipatharian black corals (Cirrhipathes sp., Leiopathes sp., Parantipathes sp., Stichopathes gravieri), soft corals (Anthomastus grandiflorus, Paragorgia arborea, Paramuricea spp., Anthothela spp. and isididaen bamboo corals), sea pens (Pennatula phosphorea, Kophobelemnon spp.), anemones (Bolocera spp), sponges (Aphrocallistes spp., Hexactinellid spp., Pheronema spp.), echinoderms (Brisingella coronata, Pseudarchaster spp., Psolus squamatus, Cidaris cidaris, Koehlermetra porrecta), crustaceans (Bathynectes spp., Chirostylus spp., Chaecon spp., Neolithoides spp.) and fish (Chimaera monstrosa, Lepidion eques, Synaphobranchus spp., Neocyttus helgae, Coryphaenoides rupestris).

Recent work on Annex I habitats in the inshore has highlighted atypical presentation of species or communities. Mulroy Bay reported a few notable species including the sponges Dercitus bucklandi, Stelletta grubii and an un-described species of Polymastia and the anthozoan Parerythropodium coralloides. Reef habitat in Kilkieran showed some unusual presentations of the sponge and ascidian community, particularly the Gurraig Sound, typified by the presence of the sponges Esperiopsis fucorum, Haliclona simulans, Myxilla incrustans, Polymastia mamillaris, Raspailia sp. and Suberites sp., Plakortis simplex and Tricheurypon viride and ascidians Ascidiella aspersa, Ascidia mentula, Ciona

intestinalis, Corella parallelogramma and Dendrodoa grossularia. The occurrence of Phakellia vermiculata and Axinella damicornis is also notable. Similarly in Kenmare River rare species included the brachiopod Neocrania anomala and at Slyne Head the nudibranch Aldisa zetlandica. The urchin, Paracentrotus lividus, a once typical intertidal Reef species, shows a restricted distribution with few records nationally.

The range and area of this habitat in Ireland has been assessed as favourable in the NPWS Article 17 Report.

Both the specific structures and functions (including species) and the future prospects have been assessed as **bad (declining**). On the basis of the above, the overall assessment of conservation status is **bad** with the overall trend assessed as **declining.**

Pressures:

- Fishing and harvesting aquatic resources **(high importance)**
- Bottom culture **(medium importance)**
- Suspension culture **(medium importance)**
- Pollution to waters (limnic & terrestrial, marine & brackish) **(medium importance)**
- Industrial ports **(low importance)**
- Intensive fish farming, intensification **(low importance)**
- Piers/tourist harbours or recreational piers **(low importance)**
- Fishing harbours **(low importance)**
- Slipways **(low importance)**
- Exploration and extraction of oil or gas **(low importance)**
- Estuarine and coastal dredging **(low importance)**
- Geotechnical survey **(low importance)**
- Nautical sports **(low importance)**
- Hand collection **(low importance)**

Threats:

- Fishing and harvesting aquatic resources **(high importance)**
- Pollution to waters (limnic & terrestrial, marine & brackish) **(medium importance)**
- Bottom culture **(low importance)**
- Suspension culture **(low importance)**
- Industrial ports **(low importance)**
- Intensive fish farming, intensification **(low importance)**
- Piers/tourist harbours or recreational piers **(low importance)**
- Fishing harbours **(low importance)**
- Slipways **(low importance)**
- Exploration and extraction of oil or gas **(low importance)**
- Estuarine and coastal dredging **(low importance)**
- Geotechnical survey **(low importance)**

Targets and attributes for the conservation of this habitat are available in the detailed Conservation Objectives for Galway Bay Complex SAC. These have been reviewed and considered in relation to the current development in Table 2.4.

Table 2.4: Impact of the proposed development on Reefs [1770] conservation objectives.

To maintain the favourable conservation condition of Reefs in Galway Bay Complex SAC			
Attributes	Measure	Target	Assessment
Distribution	Occurrence	The distribution of reefs is stable or increasing, subject to natural processes.	According to the site-specific conservation objectives (NPWS, 2013) the total estimated area of this habitat within Galway Bay Complex SAC is 2,773ha. This habitat does not occur within, or immediately adjacent to the site. The closest mapped occurrence of this habitat is 1.7km south-west of the proposal along the intertidal zone of Rusheen Bay. Mitigation measures outlined in the Construction Management Plan, ensure that any potential pathways for surface water pollution to this QI are robustly blocked. Construction best practice measures have been implemented into the construction phase of the development, as described in section 2.2.3 of the NIS and in the accompanying Construction Management Plan (CMP). Operational services, including all foul water will be connected to the local
Habitat Area	Hectares	Area stable or increasing, subject to natural processes.	
Community Extent	Hectares	Maintain the extent of the *Mytilus*-dominated reef community, subject to natural processes.	
Community structure: *Mytilus* density	Individuals per m^2	Conserve the high quality of the Mytilus-dominated reef community, subject to natural processes.	
Community structure:	Biological composition	Conserve the following community types in a natural condition: Fucoid-dominated community complex; Laminaria-dominated community complex; and Shallow sponge-dominated community complex.	

To maintain the favourable conservation condition of Reefs in Galway Bay Complex SAC			
Attributes	Measure	Target	Assessment
			public sewer. All surface water runoff will discharge to existing surface water sewers. There will be no direct or indirect loss of Reef habitat due to the proposal, and therefore no decline in distribution. There will be alteration ot the reef community in Rusheen Bay as a result of the proposal.

2.1.5 Tidal Mudflats [1140]

Information on this habitat was gained from the NPWS Article 17 report (NPWS, 2013). The habitat account in that document reads as follows:

> *This habitat is found exclusively between the low water and mean high water marks. It is often a subset of the Annex I habitats Large shallow and bay and Estuaries but is not dependent on those habitats for occurrence. The fundamental building block of this habitat is sediment ranging from around 1 micron to 2 millimeters. The finer silt and clay sediments are dominant in mud flats and the larger sand fractions are associated with areas exposed to significant wave energy. The fine sediment of intertidal mudflats is most often associated with rivers. The limit of tidal ingress often coincides with the beginning of flanking mudflat habitats. The competing forces of seaward-flowing freshwater meeting the flooding tide reduces net flow velocity and consequently the carrying capacity for sediment leading to deposition. A range of physical pressures operate in these habitats including dynamic fluctuations in salinity, temperature, and immersion. Small sediment grains can be very closely packed and the consequent minimal exchange of water may lead to oxygen deprivation of underlying sediments. Sandflats associated with larger estuaries are frequently shaped by locally generated or coastal wind-waves. The force required to dislodge sediment is dependent on the mass and cohesion of the material. Smaller lighter fractions are easily removed and become less dominant in areas exposed to wind waves. However, the packing arrangement of larger grained material allows space between grains for accumulations of finer material. This can produce cohesive and extensive flats not susceptible to eroding forces. Due to the relatively low gradient of the sandflat, wave energy is dissipated over a greater surface area. The combination of grain sizes also leads to a high retention of water within the flats producing a fairly stable physical environment with good biological productivity. In areas exposed to large waves with little or no source of riverine material the habitat is often characterized by large grains resulting from erosion or long-shore drift. Without a source of binding fine sediments these coarse sands are susceptible to frequent mobilization. The packing arrangements also allows for a free draining habitat. These coarse beaches are consequently susceptible to not only marine forces but can be mobilized by wind to form coastal habitats. The degree of mobility and harsh physiological conditions poses a significant challenge to marine flora and fauna.*
>
> *The type of biological communities found at Mudflats and Sandflats is quite variable across Ireland. Currently, approximately 50% of the national resource of this habitat has been analysed as part of baseline mapping to set Conservation Objectives. The most prevalent community identified through this process was the Mud to Fine Sand community which was often characterised by the presence of the following species Angulus tenuis, Corophium volutator, Crangon crangon, Eteone longa, Hediste diversicolor, Peringia ulvae, Pygospio elegans, Scoloplos armiger, Spio martinensis, Tharyx sp., and Tubificoides benedii where 44% of the national resource was within Lower River Shannon SAC. The next most prevalent broad community type recognised at around 40% of the habitat resource was Fine Sand to Sand community and again the largest proportion of the national resource was within Lower River Shannon SAC with typifying species including Angulus tenuis, Bathyporeia pilosa, Nephtys cirrosa, Pontocrates spp., Scolelepis mesnili, Scolelepis squamata, and Spio martinensis. The largest contribution of the remaining habitat was identified as being Muddy sands/Sandy Muds Community and the most prevalent species included Arenicola marina, Chaetozone gibber, Fabulina fabula, Nephtys hombergii, Nucula nucleus, Owenia fusiformis, and Thyasira flexuosa and the greatest proportion of this community was within Lough Swilly SAC. Occasional intertidal Zostera spp., mixed sediments and coarse sediment characterised by Pisione remota are reported. The bivalve Barnea candida, also known as white piddock, is rarely recorded in Ireland and is found in the intertidal at Bannow Bay SAC.*

Mudflats and Sandflats also form a significant resource for various bird and mammal species for feeding, breeding and resting.

The range and area of this habitat in Ireland has been assessed as **favourable** in the NPWS Article 17 Report.

The specific structures and functions (including species) have been assessed as **inadequate** but **improving** and the future prospects for the habitat have been assessed as favourable. On the basis of the above, the overall assessment of conservation status is **inadequate** with the overall trend assessed as **improving**.

Pressures:

- Pollution to surface waters (limnic & terrestrial, marine & brackish) **(high importance)**
- Fishing and harvesting aquatic resources **(high importance)**
- Bottom culture **(high importance)**
- Suspension culture **(medium importance)**
- Hand collection **(low importance)**
- Other outdoor sports and leisure activities **(low importance)**
- Nautical sports **(low importance)**

Threats:

- Pollution to surface waters (limnic & terrestrial, marine & brackish) **(high importance)**
- Fishing and harvesting aquatic resources **(low importance)**
- Bottom culture **(low importance)**
- Suspension culture **(low importance)**
- Hand collection **(low importance)**
- Other outdoor sports and leisure activities **(low importance)**
- Nautical sports **(low importance)**

Targets and attributes for the conservation of this habitat are available in the detailed Conservation Objectives for Galway Bay Complex SAC. These have been reviewed and considered in relation to the current development in Table 2.5.

Table 2.5: Impact of the proposed development on Mudflats and Sandflats not covered by water at low tide [1140] conservation objectives.

To maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide [1140] in Galway Bay Complex SAC			
Attributes	Measure	Target	Assessment
Habitat Area	Hectares	The permanent habitat area is stable or increasing subject to natural processes.	According to the Conservation objectives supporting document the habitat area was estimated using OSi data as 744ha. The nearest mapped extent of this habitat to the proposed development is in excess of 1.7km to the south-west of the site. There will be no direct loss of habitat due to the proposal.
Community distribution	Hectares	Conserve the following community types in a natural condition: Intertidal sandy mud community complex; and Intertidal sand community complex.	Intertidal sand community complex occurs on the southern shores of Galway Bay at Ballyvaghan Bay, on its eastern shores around Glasheen, Eddy and Mweenish Islands and in the Dunkellin Estuary and on the northern shore at Silverstrand, Rusheen Bay and Blake's Hill. Sandy mud to mixed sediment community complex is recorded extensively in the northern part of Galway Bay from western boundary of the site to Ardfry Point, between Tawin Island and Lackanaloy Creek and Loughnahulla Bay. In the southern part of the bay it occurs from the western

To maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide [1140] in Galway Bay Complex SAC			
Attributes	Measure	Target	Assessment
			boundary eastward into the Dunkellin Estuary and the Doorus Strait. The Galway Bay Complex SAC marine supporting documents highlights that significant anthropogenic disturbance may occur with such intensity and/or frequency as to effectively represent a continuous or ongoing source of disturbance over time and space (e.g. effluent discharge within a given area). There will be no deterioration in water quality as a result of the proposed development. Mitigation measures outlined in the CMP, ensure that any potential pathways for surface water pollution to this QI are robustly blocked. Construction best practice measures have been implemented into the construction phase of the development, as described in section 2.2.3 of the NIS and in the accompanying Construction Management Plan (CMP). Operational services, including all foul water will be connected to the local

To maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide [1140] in Galway Bay Complex SAC			
Attributes	Measure	Target	Assessment
			public sewer. All surface water runoff will discharge to existing surface water sewers.

2.1.6 Perennial Vegetation of Stony Banks [1220]

Information on this habitat was gained from the NPWS Article 17 report (NPWS, 2013). The habitat account in that document reads as follows:

This habitat occurs along the coast where shingle (cobbles and pebbles) and gravel have accumulated to form elevated ridges or banks above the high tide mark. Most of the rocky material should be less than 250mm in diameter to be considered in this category. The vegetation tends to be dominated by perennial species, typically including Honckenya peploides, Rumex crispus, Beta vulgaris ssp. maritima, Crithmum maritimum and Tripleurospermum maritimum. The rare plants Crambe maritima and Mertensia maritima are also associated with this community (Fossitt, 2000). Species diversity is determined by the degree of exposure and by substrate stability, coarseness and size. The presence of lichens indicates long term stability.

The range for this habitat has been assessed as **favourable** and the area **inadequate** (stable) in the NPWS Article 17 Report.

The specific structures and functions (including species) and future prospects have been assessed as **inadequate** but **stable**. On the basis of the above, the overall assessment of conservation status is **inadequate** with the overall trend assessed as **stable.**

The main pressures and threats identified in the Article 17 report are listed below:

Pressures:

- Sand and gravel extraction **(medium importance)**
- Removal of beach materials **(high importance)**
- Pipe lines **(low importance)**
- Disposal of inert materials **(low importance)**
- Walking, horseriding and non-motorized vehicles **(medium importance)**
- Trampling, overuse **(medium importance)**
- Garbage and solid waste **(medium importance)**
- Other forms of pollution **(low importance)**
- Landfill, land reclamation and drying out, general **(low importance)**
- Sea defence or coast protection works, tidal barrages **(high importance)**

Threats:

- Sand and gravel extraction **(medium importance)**
- Removal of beach materials **(medium importance)**
- Pipe lines **(low importance)**
- Disposal of inert materials **(low importance)**
- Walking, horseriding and non-motorized vehicles **(medium importance)**
- Trampling, overuse **(medium importance)**
- Garbage and solid waste **(medium importance)**
- Other forms of pollution **(low importance)**
- Landfill, land reclamation and drying out, general **(low importance)**
- Sea defence or coast protection works, tidal barrages **(high importance)**
- Changes in abiotic conditions **(low importance)**

Targets and attributes for the conservation of this habitat are available in the detailed Conservation Objectives for Galway Bay Complex SAC. These have been reviewed and considered in relation to the current development in Table 2.6.

Table 2.6: Impact of the proposed development on Perennial vegetation of stony banks [1220] conservation objectives.

To maintain the favourable conservation condition of Perennial vegetation of stony banks [1220] in Galway Bay Complex SAC			
Attributes	**Measure**	**Target**	**Assessment**
Habitat Area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession.	Current area unknown within the SAC. This habitat does not occur within, or immediately adjacent to the site. This habitat was not recorded in the most proximal part of the SAC to the proposed development site. There will be no direct loss of Perennial vegetation of stony banks habitat due to the proposal, and therefore no decline in distribution.
Habitat distribution	Occurrence	No decline, or change in habitat distribution, subject to natural processes.	
Physical structure: functionality and sediment supply	Presence/ absence of physical barriers	Maintain the natural circulation of sediment and organic matter, without any physical obstructions.	This habitat relies on a continuing supply of shingle sediment which may occur sporadically as a response to storm events rather than continuously. Interference with the natural coastal processes, through offshore extraction or coastal defence structures in particular, can interrupt the supply of sediment and lead to beach starvation. There will be no alteration to the physical processes that govern the

			functionality and sediment supply of this habitat. There will be no physical barriers impeding flow as a result of the proposal.
Vegetation structure: zonation	Occurrence	Maintain range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.	Ecological variation in the vegetation structure of this habitat type depends on stability; the amount of fine material accumulating between the pebbles; climatic conditions; width of the foreshore and past management of the site. The degree of exposure, as well as the coarseness and stability of the substrate determines species diversity. Negative indicators include non-native species indicative of changes in nutrient status and species not considered characteristic of the habitat. There will be no alternation in the natural processes that determine the vegetation composition as a result of the proposed development.
Vegetation composition: typical species and sub-communities	Percentage cover at a representative sample of monitoring stops.	Maintain the typical vegetated shingle flora including the range of sub-communities within the different zones. Typical species include sea sandwort *(Honckenya peploides),* sea beet (*Beta vulgaris ssp. maritima),* rock samphire (*Crithmum maritimum*), sea mayweed (*Tripleurospermum maritimum*), yellow-horned poppy (*Glaucium flavum*) and sea campion (*Silene uniflora*).	
Vegetation composition: negative indicator species	Percentage cover	Vegetation composition: negative indicator species	

2.1.7 Coastal Lagoons* [1150]

Information on this habitat was gained from the NPWS Article 17 report (NPWS, 2013). The habitat account in that document reads as follows:

> *Irish lagoons are defined on biological communities present rather than morphology. Any permanent water body, natural or artificial with salinity > 1 psu and a very restricted tidal prism is considered a lagoon. The great majority have Ruppia sp. present. Water bodies separated from the sea by barrier islands are classified as lagoons in some European countries but are not accepted as such in Ireland due to large tidal range and marine biota. Five main morphological types of lagoon are recognised in Ireland: 1. Classic "sedimentary" lagoons found on all parts of the coastline (21 lagoons, 41.4% of habitat area. 2. Artificial lagoons found on all parts of the coastline (30 lagoons, 35.2% of habitat area). 3. "Rock/peat" lagoons on the west coast, similar to lagoons in Scotland, but otherwise rare in Europe (18 lagoons, 20% of habitat area). 4. "Karst" lagoons found in parts of Counties Clare and Galway, and within Europe, possibly unique to Ireland (11 lagoons, 4.5% of habitat area). 5. "Saltmarsh" lagoons (6 lagoons, 1.5% of habitat area).*

The range and area of this habitat in Ireland has been assessed as **favourable** in the NPWS Article 17 Report.

The specific structures and functions (including species) and future prospects for the habitat have both been assessed as **unfavourable (bad).** On the basis of the above, the overall assessment of conservation status is **bad** with the overall trend assessed as **stable**.

Pressures:

- Pollution to surface waters (limnic & terrestrial, marine & brackish) **(high importance)**
- Erosion **(high importance)**
- Silting up **(medium importance)**
- Fertilisation **(high importance)**
- Reclamation of land from sea, estuary or marsh **(high importance)**
- Accumulation of organic material **(medium importance)**
- Marine and freshwater aquaculture **(low importance)**
- Removal of beach materials **(low importance)**
- Urbanised areas, human habitation **(low importance)**
- Golf course **(low importance)**
- Circuit, track **(low importance)**
- Camping and caravans **(low importance)**
- Invasive non-native species **(low importance)**
- Disposal of household/recreational facility waste **(high importance)**

Threats:

- Pollution to surface waters (limnic & terrestrial, marine & brackish) **(high importance)**
- Modification of hydrographic functioning, general **(high importance)**
- Erosion **(high importance)**
- Silting up **(medium importance)**
- Fertilisation **(high importance)**
- Reclamation of land from sea, estuary or marsh **(high importance)**
- Accumulation of organic material **(medium importance)**
- Marine and freshwater aquaculture **(low importance)**
- Removal of beach materials **(low importance)**

- Urbanised areas, human habitation **(low importance)**
- Golf course **(low importance)**
- Circuit, track **(low importance)**
- Camping and caravans **(low importance)**
- Invasive non-native species **(low importance)**
- Disposal of household/recreational facility waste **(high importance)**

Targets and attributes for the conservation of this habitat are available in the detailed Conservation Objectives for Galway Bay Complex SAC. These have been reviewed and considered in relation to the current development in Table 2.7.

Table 2.7: Impact of the proposed development on Coastal lagoons [1150] conservation objectives.

To restore the favourable conservation condition of Coastal lagoons [1150] in Galway Bay Complex SAC			
Attributes	Measure	Target	Assessment
Habitat Area	Hectares	Area stable, subject to slight natural variation. The favourable reference area is 76.7ha.	The closest mapped lagoon to the proposed development is Lough Atalia. Favourable reference area for mapped lagoon habitat within the SAC is 76.7ha and according to the conservation objectives supporting documents for lagoons there may be more, as yet unmapped, lagoons within this site (NPWS, 2013). No Lagoon was recorded in the vicinity of the proposed development and there is no potential for habitat loss or decline in distribution as a result of the proposed development.
Habitat distribution	Occurrence	No decline, subject to natural processes.	
Salinity regime	Practical salinity units (psu)	Median annual salinity and temporal variation within natural ranges.	The salinity regime of lagoons depends on the volume and timing of inflowing and outflowing fresh and seawater. There will be no alteration in flow regime as a result of the proposed development.
Hydrological regime	Metres	Annual water level fluctuations and minima within natural ranges.	Fluctuations in water depth are a natural feature of lagoon hydrology. However, if water levels fluctuate beyond their

To restore the favourable conservation condition of Coastal lagoons [1150] in Galway Bay Complex SAC			
Attributes	Measure	Target	Assessment
			natural values due to issues such as drainage, the condition of the habitat can deteriorate. No drainage will take place as a result of the proposed development.
Barrier: connectivity between lagoon and sea	Permeability	Appropriate hydrological connections between lagoons and sea, including where necessary, appropriate management	The morphology of the barrier between a lagoon and sea determines how it functions ecologically. Changes to the barrier can be due to natural processes such as storms, but they can also be modified through human intervention. The proposed development will not result in a loss of connectivity between lagoons and sea and no barriers to connectivity will occur as a result of the proposal.
Water quality: Chlorophyll a	µg/L	Annual median chlorophyll a within natural ranges and less than µg/L	This attribute indicates the level of phytoplankton in the water column. Phytoplankton tends to increase in density in response to increasing nutrient levels. Excessive shading from phytoplankton can reduce submergent macrophyte colonisation of the littoral zone of lagoons.

To restore the favourable conservation condition of Coastal lagoons [1150] in Galway Bay Complex SAC			
Attributes	Measure	Target	Assessment
			There will be no deterioration in water quality due to an increase in nutrient levels as a result of the proposed development. Mitigation measures outlined in the CMP, ensure that any potential pathways for surface water pollution to this QI are robustly blocked. Construction best practice measures have been implemented into the construction phase of the development, as described in section 2.2.3 of the NIS and in the accompanying Construction Management Plan (CMP). Operational services, including all foul water will be connected to the local public sewer. All surface water runoff will discharge to existing surface water sewers.
Water quality: Molybdate Reactive Phosphorus (MRP)	mg/L	The target for the attribute water quality-Molybdate Reactive Phosphorus (MRP) is: annual median MRP within natural ranges and less than 0.1mg/L.	This limit is required to ensure that excessive shading from phytoplankton does not reduce submergent colonisation of the littoral zone.

To restore the favourable conservation condition of Coastal lagoons [1150] in Galway Bay Complex SAC			
Attributes	Measure	Target	Assessment
			There will be no deterioration in water quality as a result of the proposal. Mitigation measures outlined in the CMP, ensure that any potential pathways for surface water pollution to this QI are robustly blocked. Construction best practice measures have been implemented into the construction phase of the development, as described in section 2.2.3 of the NIS and in the accompanying Construction Management Plan (CEMP). Operational services, including all foul water will be connected to the local public sewer. All surface water runoff will discharge to existing surface water sewers
Water quality: Dissolved Inorganic Nitrogen (DIN)	mg/L	Annual median DIN within natural ranges and less than 0.15mg/L	There will be no deterioration in water quality as a result of the proposal. Mitigation measures outlined in the CMP, ensure that any potential pathways for surface water pollution to this QI are robustly blocked. Construction best practice measures have been implemented into the construction phase of the development, as described in section 2.2.3 of the NIS

To restore the favourable conservation condition of Coastal lagoons [1150] in Galway Bay Complex SAC			
Attributes	Measure	Target	Assessment
			and in the accompanying Construction Management Plan (CMP). Operational services, including all foul water will be connected to the local public sewer. All surface water runoff will discharge to existing surface water sewers.
Depth of macrophyte colonisation	Metres	Macrophyte colonisation to at least 2m depth	There will be no effects on plant and animal species associated with lagoons, as a result of the proposal, due to the separation distance and the lack of potential for water pollution. Mitigation measures outlined in the CMP, ensure that any potential pathways for surface water pollution to this QI are robustly blocked. Construction best practice measures have been implemented into the construction phase of the development, as described in section 2.2.3 of the NIS and in the accompanying Construction Management Plan (CMP). Operational services, including all foul water will be connected to the local public sewer. All surface water runoff
Typical plant species	Number and m^2	Maintain number and extent of listed lagoonal specialists, subject to natural variation	
Typical animal species	Number	Maintain listed lagoon specialists, subject to natural variation	

To restore the favourable conservation condition of Coastal lagoons [1150] in Galway Bay Complex SAC			
Attributes	Measure	Target	Assessment
			will discharge to existing surface water sewers.
Negative indicator species	Number and % cover	Negative indicator species absent or under control	Low salinity, shallow water and elevated nutrient levels increase the threat of accelerated encroachment by reedbeds. There will be no alteration to salinity levels, nutrient levels or the hydrological regime of the lagoon as a result of the proposed development. There will be no deterioration in water quality as a result of the proposal. Mitigation measures outlined in the CEMP, ensure that any potential pathways for surface water pollution to this QI are robustly blocked. Construction best practice measures have been implemented into the construction phase of the development, as described in section 2.2.3 of the NIS and in the accompanying Construction Environmental Management Plan (CMP). Operational services, including all foul water will be connected to the local public sewer. All surface water runoff

To restore the favourable conservation condition of Coastal lagoons [1150] in Galway Bay Complex SAC			
Attributes	Measure	Target	Assessment
			will discharge to existing surface water sewers.

2.1.8 Large Shallow Inlets and Bays [1160]

Information on this habitat was gained from the NPWS Article 17 report (NPWS, 2013). The habitat account in that document reads as follows:

> *The EU interpretation manual describes Large Shallow Inlets and Bays as indentations of the coast where, in contrast to estuaries, the influence of freshwater is generally limited or reduced. These habitats are typically shallower and more sheltered than open coasts and can report a variety of different habitat forms. They are variously composed of fine sediments to bedrock, intertidally and subtidally, and in Ireland are typified to a large extent by their constituent sub-habitats. They are frequently the vestiges of glacial erosion (Lough Swilly) or deposition (Clew Bay) and occasionally occur at the mouth of rivers where the lower density of freshwater flows over the fully marine benthos and vertical wind-driven mixing of layers is absent or significantly reduced. The shallow and sheltered nature of these habitats results in highly productive and frequently diverse areas in terms of both species and communities.*
>
> *Large Shallow Inlets and Bays habitats frequently incorporate a number of constituent Annex I habitats including Sandbank at the mouth of the Lower River Shannon where Nephtys cirrosa and Bathyporeia elegans characterised the habitat. Sediment and Reef communities constitute the majority of the remaining habitats (including the intertidal Annex I habitat). The three most prevalent sediment communities which account for 70% of the examined habitats of Large Shallow Inlets and Bays include: Fine Sand to Sand community shown usually to express dominance in the following species: Angulus tenuis, Arenicola marina, Chaetezone christei, Fabulina fabula, Iphinoe trispinosa, Nephtys cirrosa, Pontocrates arenarius, Pygospio elegans, Scolelepis mesnili, Scolelepis squamata, Scoloplos armiger, Spio martinensis, and Spiophanes bombyx; Muds to Fine Sand Community commonly reporting Crangon crangon and Pygospio elegans; and Muddy Sands/Sandy Muds Community typified by Abra alba, Chaetozone gibber, Donax vittatus, Euclymene oerstedii, Kurtiella bidentata, Lumbrineris gracilis, Melinna palmata, Nephtys hombergii, Nucula nucleus, Thyasira flexuosa and Owenia fusiformis.*
>
> *Habitats associated with hard substrates constitute around 20% of the intertidal and subtidal habitat. The typical species for inshore reef habitats is dependent on a number of factors including depth and exposure (described under 1170). Intertidal and subtidal hard ground in Bays and Inlets are frequently dominated by fucoid and Laminaria algal species. In deeper water the reef habitats tend to be predominantly sponges an anemones with associated polychaetes, molluscs, bryozoans, tunicates, crustaceans and fish species.*
>
> *A very significant proportion of some less frequently encountered species in Ireland have been found within the boundaries of Large Shallow Inlets and Bays including 85% of mapped maërl (Lithothamnion corallioides and Phymatolithon calcareum) and 70% of mapped eel grass beds (Zostera marina and Z. noltii), all records of the endemic species Edwardsia delapiae in Valentia Harbour, all mapped areas of the reef building polychaete Sabellaria alveolata, and the majority of such species as Neopentadactyla mixta, Pachycerianthus multiplicatus, Sabella pavonia, and Virgularia mirabilis. Limaria hians, commonly known as the gaping file shell forms a "nest" of byssus threads. Where these are sufficiently dense, they form reefs on the sediment; Mulroy Bay is the only known area in Ireland where these bivalves occur.*
>
> *This Annex I habitat also forms an important resource for various bird and mammal species (notably Annex II marine* mammals) for feeding, breeding and resting.

The range and area of this habitat in Ireland has been assessed as favourable in the NPWS Article 17 Report.

The specific structures and functions (including species) have been assessed as inadequate but improving and the future prospects for the habitat have been assessed as favourable. On the basis of the above, the overall assessment of conservation status is inadequate with the overall trend assessed as improving.

Pressures:

- Fishing and harvesting aquatic resources **(high importance)**
- Bottom culture **(medium importance)**
- Suspension culture **(medium importance)**
- Other outdoor sports and leisure activities **(medium importance)**
- Pollution to waters (limnic & terrestrial, marine & brackish) **(low importance)**
- Nautical sports **(low importance)**
- Hand collection **(low importance)**
- Intensive fish farming, intensification **(low importance)**

Threats:

- Fishing and harvesting aquatic resources **(high importance)**
- Other outdoor sports and leisure activities **(medium importance)**
- Pollution to waters (limnic & terrestrial, marine & brackish) **(low importance)**
- Bottom culture **(low importance)**
- Suspension culture **(low importance)**
- Nautical sports **(low importance)**
- Hand collection **(low importance)**

Targets and attributes for the conservation of this habitat are available in the detailed Conservation Objectives for Galway Bay Complex SAC. These have been reviewed and considered in relation to the current development in Table 2.8.

Table 2.8: Impact of the proposed development on Large shallow inlets and bays [1160] conservation objectives.

To maintain the favourable conservation condition of Large shallow inlets and bays [1160] in Galway Bay Complex SAC			
Attributes	Measure	Target	Assessment
Habitat Area	Hectares	Area stable or increasing, subject to natural processes.	According to the conservation objectives supporting document the habitat area was estimated as 10,825ha using OSI data and the Transitional Water Body area as defined under the Water Framework Directive (NPWS, 2013). The closest mapped extent of this habitat lies in excess of 1.7km south west of the proposed development site. Pollution to water is listed as a threat to this habitat. There will be no loss of habitat as a result of deterioration in water quality due to the proposal. Comprehensive water pollution mitigation measures (outlined in the CEMP) will ensure protection of all downstream receiving waters during construction and operational phases of the development. Controls will also be put in place to manage risks associated with hydrocarbons/chemicals and cement based products used during construction phase.

To maintain the favourable conservation condition of Large shallow inlets and bays [1160] in Galway Bay Complex SAC			
Attributes	Measure	Target	Assessment
			Operational services, including all foul water will be connected to the local public sewer. All surface water runoff will enter existing surface water sewers. These measures are further described in Section 2.2 of this report.
Community Extent	Hectares	Maintain the extent of the Zostera-dominated community complex and the maërl-dominated community, subject to natural processes.	The main causes of decline in Zostera-dominated communities in recent decades are anthropogenic and include land reclamation, coastal development, boating and fishing activity, sewage discharge and agricultural run-off often result in physical disturbance and siltation as well as increased water turbidity and nutrient loading (Spalding et al. 2003). Maerl communities are very sensitive to substratum loss, smothering, increase in suspended sediment, abrasion and physical disturbance which can prevent light reaching the living maerl and therefore halt photosynthesis (Jones et al., 2000).
Community structure: Zostera density	Shoots per m^2	Conserve the high quality of Zostera-dominated communities, subject to natural processes	
Community structure:	Biological composition	Conserve the high quality of the maërl-dominated community, subject to natural processes	

To maintain the favourable conservation condition of Large shallow inlets and bays [1160] in Galway Bay Complex SAC			
Attributes	Measure	Target	Assessment
			As outlined above there will be no deterioration in water quality due to the proposal.
Community distribution	Hectares	Conserve the following community types in a natural condition: Intertidal sandy mud community complex; Intertidal sand community complex; Fine to medium sand with bivalves community complex; Sandy mud to mixed sediment community complex; Mixed sediment dominated by Mytilidae community complex; Shingle; Fucoid-dominated community complex; Laminaria-dominated community complex; and Shallow sponge-dominated community complex.	Typical species will vary depending on the depth, substrate and degree of exposure to wave action. There will be no alteration to the physical processes that form these communities. As outlined above there will be no deterioration in water quality due to the proposal.

Table 2.9: Impact of the proposed development on the conservation objectives of Otter (Lutra lutra) [1355]

To restore the favourable conservation condition of Otter in Galway Bay Complex SAC, which is defined by the following list of attributes and targets			
Attributes	**Measure**	**Target**	**Assessment**
Distribution	Percentage of positive survey sites	No significant decline	This species was not recorded during the field survey and no suitable habitat occurs on site. The site is not of significance to this species. There will be no decline in extent of terrestrial, marine or freshwater habitat. There will be no loss of habitat as a result of deterioration in water quality due to the proposal. Comprehensive water pollution mitigation measures (outlined in the CEMP) will ensure protection of all downstream receiving waters during construction and operational phases of the development. Controls will also be put in place to manage risks associated with hydrocarbons/chemicals and cement based products used during construction phase. There will be no barriers to connectivity as a result of the proposed development.
Extent of terrestrial habitat	Hectares	No significant decline. Area mapped and calculated as 262ha above high water mark (HWM); 14ha along river banks/around pond	
Extent of marine habitat	Hectares	No significant decline. Area mapped and calculated as 2040ha	
Extent of freshwater (river) habitat	Kilometers	No significant decline. Length mapped and calculated as 4km	
Extent of freshwater (lake/lagoon) habitat	Hectares	No significant decline. Area mapped and calculated as 21ha	
Couching sites and holts	Number	No significant decline.	
Fish biomass available	Kilograms	No significant decline.	
Barriers to connectivity	Number	No significant increase.	

BIBLIOGRAPHY

Dale, A. L., McAllen, R. & Whelan, P. (2007) Management considerations for subtidal Zostera marinabeds in Ireland. Irish Wildlife Manuals, No. 28. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland

Jones, L.A., Hiscock, K., & Connor, D.W. (2000). Marine habitat reviews. A summary of ecological requirements and sensitivity characteristics for the conservation and management of marine SACs. Joint Nature Conservation Committee, Peterborough. (UK Marine SACs Project report)

Spalding, M., Taylor, M., Ravilious, C., Short, F., Green, E. (2003). The distribution and status of seagrasses, pp5-26. In: Spalding, M., Taylor, M., Ravilious, C., Short, F., Green, E. (eds.), World Atlas Of Seagrasses.University of California Press. 298pp.

APPENDIX 3

LETTER FROM IRISH WATER

DBFL c/o John Moloney
Ormond House
Upper Ormond Quay
Dublin 7

Uisce Éireann
Bosca OP 6000
Baile Átha Cliath 1
Éire

Irish Water
PO Box 6000
Dublin 1
Ireland

T: +353 1 89 25000
F: +353 1 89 25001
www.water.ie

14th August 2019

Dear Sir/Madam,

Re: Customer Reference No 1000850255 pre-connection enquiry - Subject to contract | Contract denied
Connection for 340 Housing Units & 3,200 sqm of Retail Space

Irish Water has reviewed your pre-connection enquiry in relation to water and wastewater connections at Knocknacarra, Galway . Based upon the details that you have provided with your pre-connection enquiry and on the capacity currently available in the network(s), as assessed by Irish Water, we wish to advise you that, subject to a valid connection agreement being put in place, your proposed connection to the Irish Water network(s) can be facilitated.

A wastewater connection can be facilitated to the Irish Water 300mm diameter wastewater network which runs to the south west of the proposed development site. Please see the enclosed indicative Irish Water GIS map which indicates the location of the Irish Water networks. It is noted that the proposed retail type discharge may require a Trade Effluent to Sewer Discharge Licence to be in place prior to connection being made. The applicant is advised to visit https://www.water.ie/for-business/trade-effluent/ in this regard.

A watermain connection can be facilitated to the Irish Water 150mm diameter watermain network. The confirmation of feasibility to connect to the Irish Water infrastructure does not extend to your fire flow requirements. To guarantee a flow to meet the Fire Authority requirements you should provide adequate fire storage capacity within your development.

Strategic Housing Development
Irish Water notes that the scale of this development may dictate that it is subject to the Strategic Housing Development planning process. Therefore in advance of submitting your full application to An Bord Pleanala for assessment, you must have reviewed this development with Irish Water and received a Statement of Design Acceptance in relation to the layout of water and wastewater services. A design proposal for the water and/or wastewater infrastructure can be submitted to cdsdesignqa@water.ie for assessment.

This feasibility feedback relates to the capacity of the Irish Water network to cater for the proposed development's demand/loadings. Irish Water networks traverse the proposed development site as indicated in the enclosed Irish Water GIS Map. Should you require to divert Irish Water assets you will require to liaise with the Irish Water diversions team. Proposals can be submitted to diversions@water.ie. to allow feasibility feedback to be provided. Further information in this regard is available at https://www.water.ie/connections/developer-services/diversions/.

You are advised that this correspondence does not constitute an offer in whole or in part to provide a connection to any Irish Water infrastructure and is provided subject to a connection agreement being signed at a later date.

A connection agreement can be applied for by completing the connection application form available at **www.water.ie/connections**. Irish Water's current charges for water and wastewater connections are set out in the Water Charges Plan as approved by the Commission for Regulation of Utilities.

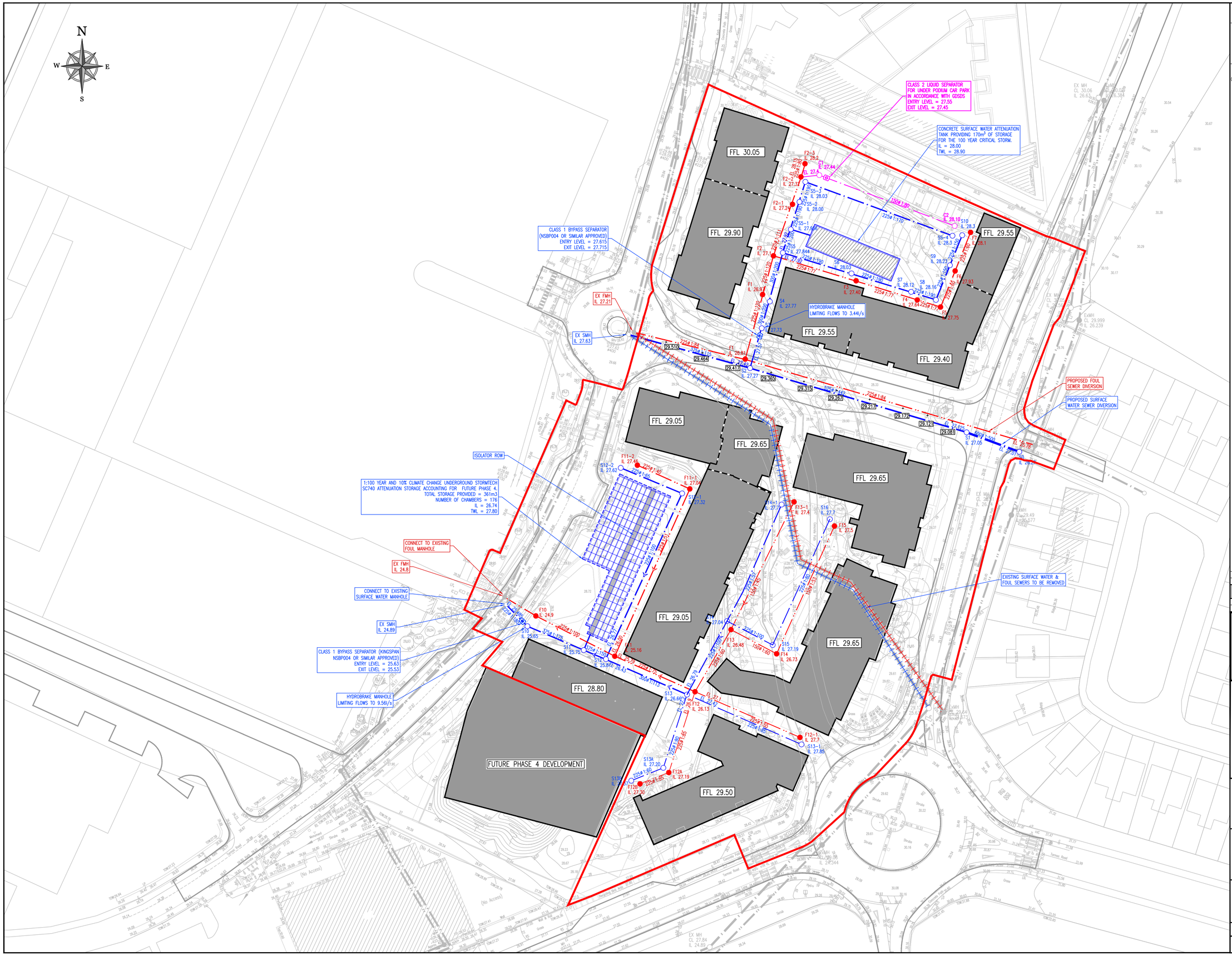
If you have any further questions, please contact James O Malley from the design team at jomalley@water.ie. For further information, visit **www.water.ie/connections**

Yours sincerely,

Maria O'Dwyer
Connections and Developer Services

APPENDIX 4

DETAILED DESIGN DRAWINGS



ON ORIGINAL

0 5 10 15 20 25 30 40 50mm

NOTES:

GENERAL NOTES:

1. ALL DRAWINGS TO BE CHECKED BY CONTRACTOR ON SITE AND ENGINEER INFORMED OF DISCREPANCIES BEFORE WORK COMMENCES.
2. THE CONTRACTOR SHALL SATISFY HIMSELF AS TO THE ACCURACY OF EXISTING DRAINAGE LEVELS AND LOCATION OF EXISTING SERVICES ON SITE PRIOR TO COMMENCEMENT OF WORKS ON SITE.
3. ALL DIMENSIONS AND LEVELS ARE IN METERS AND ARE RELATED TO ORDINANCE DATUM. CO-ORDINATES RELATE TO IRISH TRANSVERSE MERCATOR.
4. ALL FOUL SEWERS, MANHOLES AND CONNECTIONS TO BE CONSTRUCTED IN ACCORDANCE WITH IRISH WATER CODE OF PRACTICE FOR WASTEWATER INFRASTRUCTURE AND IRISH WATER WASTEWATER INFRASTRUCTURE STANDARD DETAILS.
5. ALL FOUL SEWER HOUSE CONNECTIONS TO BE MIN 100mmø UPVC TO IS EN 1401 2009/2012, STIFFNESS CLASS 8KN/M2 IN ACCORDANCE WITH IRISH WATER SPECIFICATIONS.
6. ALL PUBLIC FOUL SEWERS PIPE MATERIAL TO BE IN COMPLIANCE WITH SECTION 3.13 OF IRISH WATER WASTEWATER CODE OF PRACTICE.
7. ALL PUBLIC SURFACE WATER SEWERS TO BE MINIMUM 225 DIA. CLASS H CONCRETE TO EN1916 & IS 6 2004 IN ACCORDANCE WITH THE GREATER DUBLIN REGIONAL CODE OF PRACTICE FOR DRAINAGE WORKS.
8. ALL SURFACE WATER CONNECTIONS TO BE MINIMUM 150mmø UPVC TO IS EN 1401 2009/2012 IN ACCORDANCE WITH THE GREATER DUBLIN REGIONAL CODE OF PRACTICE FOR DRAINAGE WORKS.
9. LOCATION AND INVERT LEVELS OF EXISTING MANHOLES OR OUTFALL POINTS, WHERE APPLICABLE TO BE VERIFIED BY CONTRACTOR PRIOR TO COMMENCEMENT OF DRAINAGE WORKS.
10. ALL COVER LEVELS TO MATCH FINISHED ROAD/VERGE/FOOTPATH/CYCLETRACK LEVELS UNLESS OTHERWISE STATED.
11. CONTRACTOR TO INCLUDE FOR CCTV SURVEY OF ALL SEWERS UPON COMPLETION OF SAME.
12. ALL FOUL SEWERS TO BE AIR TESTED IN ACCORDANCE WITH IRISH WATER SPECIFICATIONS.

LEGEND

- SITE BOUNDARY
- PROPOSED SURFACE WATER DRAINAGE
- PROPOSED GULLY
- PROPOSED FOUL SEWER
- PROPOSED CAR PARK INCIDENTAL DRAINAGE
- EX SW SEWER
- EX FOUL SEWER
- PROPOSED ROAD LEVELS (99.99)
- EXISTING ROAD LEVELS (99.99)
- FINISHED FLOOR LEVEL (99.99)

REV.	DATE	DESCRIPTION	BY	CHKD

PLANNING

DESIGNED	NCG	PREPARED	DGL
DATE	MAY 2019	CHECKED	DJR

DBFL Consulting Engineers
DUBLIN OFFICE Ormond House, Upper Ormond Quay, Dublin 7, Ireland.
PHONE +353 1 400 4000
FAX +353 1 400 4050
WATERFORD OFFICE Unit 2, The Chandlery, 1-2 O' Connell Street, Waterford, Ireland.
PHONE +353 51 309 500
FAX +353 51 844 913
EMAIL info@dbfl.ie SITE www.dbfl.ie

Glenveagh Living

PROJECT
KNOCKNACARRA DISTRICT CENTRE, RAHOON, GALWAY.

DRG. TITLE
SITE SERVICES LAYOUT

ARCHITECT
REDDY ARCHITECTS

SCALE	1:500 @A1	FILE REF.	180191-3000

DRG. NO. 180191-3000 .