Planning and Environmental Consultants

Natura Impact Statement

Strategic Housing Development - Rosshill, Galway

DOCUMENT DETAILS

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Prepared By:	**MKO** **Tuam Road** **Galway** **Ireland** **H91 VW84**

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1. INTRODUCTION

1.1 Background

The assessment material contained within this Natura Impact Statement (NIS) has been prepared by McCarthy Keville O'Sullivan Ltd. (MKO).

It has been prepared in order to provide the information necessary to allow the competent authority to conduct an Appropriate Assessment in accordance with Part XAB of the Planning and Development Acts 2000 to 2018 and the requirements of Article 6(3) of the Habitats Directive (Directive 92/43) and pertaining to a proposed Strategic Housing Development at Rosshill, Co. Galway.

The project has been subject to the Appropriate Assessment screening process, which is contained within Appendix 1 of this Report.

1.2 Appropriate Assessment Methodology

This document was 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 (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;
3. 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;
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

Firstly, in Section 2 of the report, a comprehensive project description is provided.

Following on from this in Section 3, the Baseline environment is described with respect to the Qualifying Interests/Special Conservation Interests (QIs & SCIs) of the "screened in" European Sites with subsequent assessment of identified potential pathways for effects on the Qualifying Interests/Special Conservation Interests provided in Section 4. The assessment takes into consideration the conservation objectives and associated targets and attributes for the relevant Qualifying Interests/Special Conservation Interests.

The assessment of potential adverse effects follows the precautionary principle as prescribed in Article 191 of the Treaty on the Functioning of the European Union (EU). It aims at ensuring a higher level of environmental protection through preventative decision-taking in the case of risk and underpins the Habitats Directive (DoEHLG, 2010). The precautionary principle is the underlying concept of sustainable development which implies that prudent action be taken to protect the environment even in the absence of scientific certainty (DoEHLG, 2010). Potential adverse effects are assessed in view of best scientific knowledge, on the basis of objective information in relation to the proposed development including the proposed avoidance, reduction and preventive measures.

Following the assessment of potential adverse effects on a European Site resulting from the project itself, a further assessment of the potential for effects when the proposed development is considered cumulatively and in combination with other plans or projects is made in Section 5.

Finally, in Section 6 a concluding statement is made.

1.3 Screening Summary

As already outlined, the project has been subject to the Appropriate Assessment screening process which, based on the contents of a technical report prepared by McCarthy Keville O'Sullivan, concluded that:

> "*It cannot be concluded beyond reasonable scientific doubt, in view of best scientific knowledge on the basis of objective information and in light of the conservation objectives of the relevant European sites, that the proposed development, individually or in combination with other plans and projects, would not have a significant effect on the Galway Bay Complex SAC and Inner Galway Bay SPA.*
>
> *As a result, an Appropriate Assessment is required and a Natura Impact Statement shall be prepared in respect of the proposed development*".

1.4 Statement of Authority

A field assessment was undertaken in April 2019 by Sarah Mullen (B.Sc., Ph.D.) and Claire Stephens (BSc) of McCarthy Keville O'Sullivan Ltd (MKO) and again in July 2019 by Sarah Mullen. This report has been prepared by Sarah Mullen and Claire Stephens. This report has been reviewed by John Hynes (B.Sc., M.Sc., MCIEEM) who has over 8 years' experience in ecological assessment.

1.5 Consultation with Relevant Bodies

The Development Applications Unit (DAU) of the Department of Culture, Heritage & The Gaeltacht was consulted on the 7th March 2019 (Reference No: G Pre00082/2019). A response was received on the

11th of April 2019 (Appendix 2). The recommendations of the DAU have been considered in the preparation of this NIS.

2. DESCRIPTION OF THE PROJECT

2.1 Site Location

The development site is located within the townlands of Roscam, Merlin Park and Murrough in Galway City, immediately south of the Rosshill Road and the railway line (Grid Reference: IG 134208 224980) (Figure 2.1). The proposed development site is 10.0693ha and is surrounded by a number of small residential developments and individual houses.

2.2 Characteristics of the Proposed project

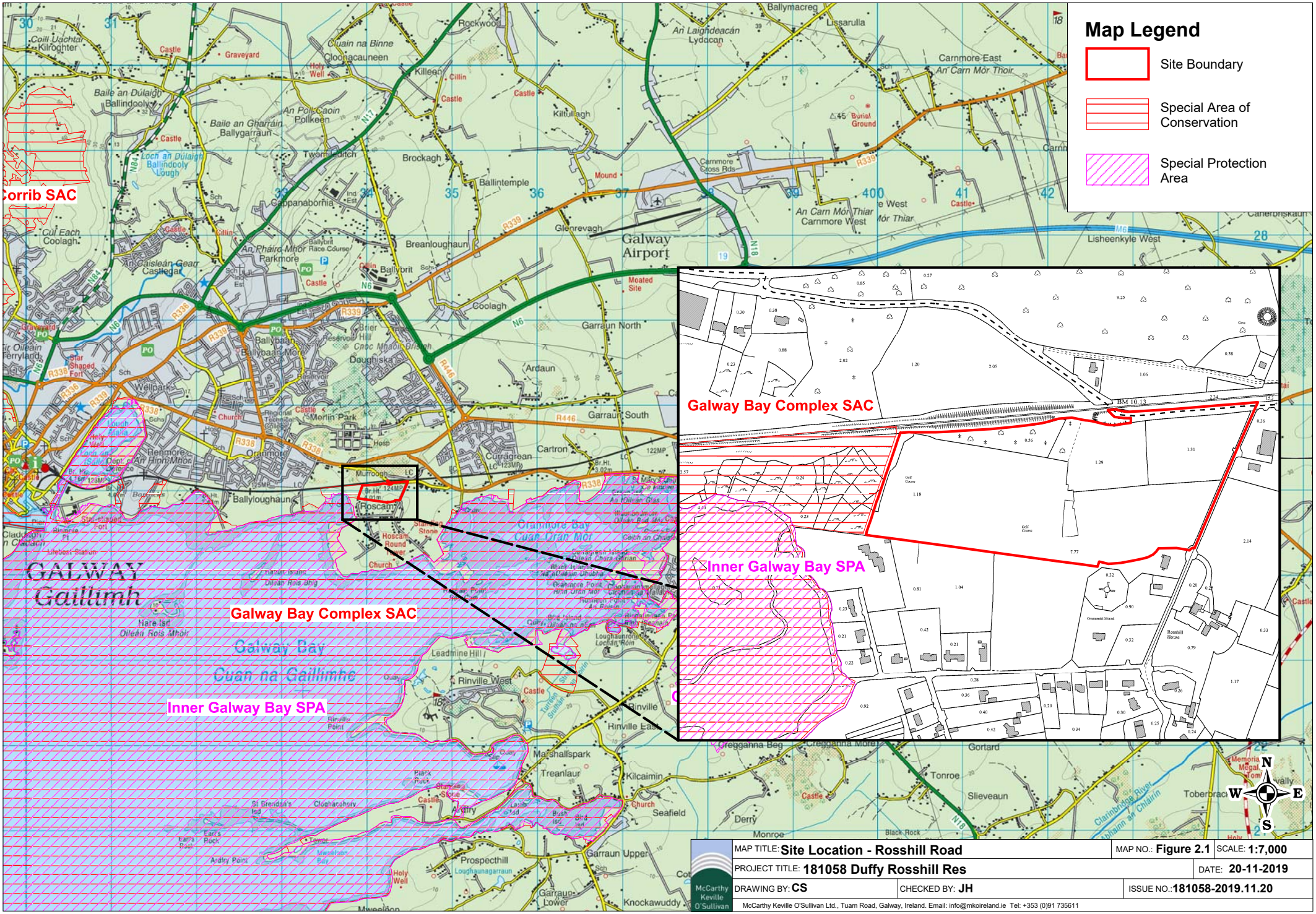
The application for the proposed works will be made under the Strategic Housing Development (SHD) provisions of the Planning and Development (Housing) and Residential Tenancies Act, 2016. The proposed development will consist of the following:

- Construction of 342 no. residential units comprising:
  - 36no. Four Bed Semi-Detached Houses
  - 2 no. Four Bed Detached Houses
  - 68 no. Three Bed Semi-Detached Houses
  - 63 no. Three Bed Terrace
  - 6 no. Two Bed Terrace
  - 5 no. Three Bed Long Semi-Detached Houses
  - 5 no. Four Bed Long Semi-Detached Houses
  - 38 no. One Bed Apartments
  - 119 no. Two Bed Apartments
- A ground-floor community space
- Office, cafe and retail units
- A two-storey childcare facility
- The provision of public realm landscaping including shared public open space and play areas, public art, public lighting, resident and visitor parking including car rental bays, electric vehicle charging points and bike rental spaces
- Pedestrian, cyclist and vehicular links throughout the development.
- Access road and junction improvements at Rosshill Road/Old Dublin Road.
- Provision of all associated surface water and foul drainage services and connections including pumping station. All associated site works and ancillary services.

A site layout is shown in Figure 2.2.

2.2.1 Surface Water Management

A drainage report with regard to the onsite treatment of wastewater and surface water for this development has been completed by Tobin Engineers. The storm water drainage design has been designed to cater for all surface water runoff from all hard surfaces in the proposed development. All stormwater generated on site from roadways and roofs will discharge via an oil/petrol interceptor to one of 12 no. proposed soakaways which are strategically situated throughout the site. The stormwater will soak away through the underlying fractured rock/boulders. The soakaways are constructed of a cellular storage unit providing 95% porosity or stone filled soakaway providing 40% void ratio. These will also attenuate storm water during and post storm events prior to infiltrating through the underlying fracture rock/boulders.



MAP TITLE: **Site Location - Rosshill Road**		MAP NO.: **Figure 2.1**	SCALE: **1:7,000**
PROJECT TITLE: **181058 Duffy Rosshill Res**			DATE: **20-11-2019**
DRAWING BY: **CS**	CHECKED BY: **JH**	ISSUE NO.: **181058-2019.11.20**	

McCarthy Keville O'Sullivan

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MASTER SITE LAYOUT PLAN

NOTE : PLEASE REFER TO ENGINEERS DRAWINGS & REPORTS FOR SERVICE CONNECTION DETAILS

Overall site Mix:

038 no. 1 Bedroom units	11.1%
125 no. 2 Bedroom units	36.5%
136 no. 3 Bedroom units	39.8%
043 no. 4 Bedroom units	12.6%
	100%

Mix by type:

157 Apartments	45.9%
069 Terraces	20.2%
114 Semi-Detached	33.3%
002 Detached	00.6%
	100%

LEGEND

Site boundary outlined in red

OVERALL SITE AREA : **100,693 sqm :- 10.069HA :- 24.881 Acre**
Verges to Old Dublin Road & Rosshill Rd. **: 3,381 sqm :- 0.338 HA**
Junction area **: 628 sqm :- 0.063 HA**
RA zoned Land to west boundary **: 1,292 sqm :- 0.129 HA**
Developable Area : 95,392 sqm :- 9.539 HA :- 23.572 Acre

Galway City Council Development plan 2017-2023:
Site zoned Low Density Residential (LDR)

RESIDENTIAL TOTAL NO. OF UNITS = 342

Density:
35.8 Units per Ha - Residential Density (342 total units on 9.539 ha.)
14.5 Units per Acre - Residential Density (342 total units on 23.572 acre)

Plot ratio **: 0.36 :1** (max allowable 0.46:1)
Site Coverage **: 15.34%**

45.9% Apartments = 157 Units
54.1% Houses = 185 Units

Residential Dwelling Units:

Type 'A-A6'	- 4 bed	Semi -Detached	- Circa 125.4 sqm	TOTAL 36 UNITS
Type 'A2'	- 4 bed	Detached	- Circa 125.4sqm	TOTAL 02 UNITS
Type 'B-B7'	- 3 bed	Semi -D	- Circa 110.4 sqm	TOTAL 24 UNITS
Type 'C-C8'	- 3 bed	Semi -D	- Circa 108.2 sqm	TOTAL 44 UNITS
Type 'C-C10'	- 3 bed	Terrace	- Circa 108.2 sqm	TOTAL 63 UNITS
Type 'D'	- 2 bed	Terrace	- Circa 84.4 sqm	TOTAL 06 UNITS
Type 'E'	- 3 bed	Long semi-D	- Circa 107 sqm	TOTAL 05 UNITS
Type 'F'	- 4 bed	Long semi-D	- Circa 129.8 sqm	TOTAL 05 UNITS

TOTAL UNITS ON SITE = 185 UNITS

Apartment Units:

Type '1A- 1D'	- 1 bed	Apartment	- Circa 49.2sqm (varies) TOTAL 038 UNITS
Type '2A - 2N'	- 2 bed	Apartment	- Circa 78sqm(varies) TOTAL 119 UNITS

TOTAL UNITS ON SITE = 157 UNITS

Public open space requirement over developable area: 15% - 14,309sqm
Public open space provided- Over 21,533sqm - 22.57%
(above 10m wide/ 200sqm & reasonably level usable space)
Overall Green and landscaped space across the site: 25,130sqm - 25.8%

FOR 1:500 SCALE - PART SITE PLAN 1 REFER TO SHEET 3003

FOR 1:500 SCALE - PART SITE PLAN 2 REFER TO SHEET 3004

01 Master Site Layout Plan
Scale: 1:1000

Figure 2.2 Site Layout

MASTER SITE LAYOUT PLAN

CONDITIONS OF USE OF THIS DRAWING: 1. The use of or reliance upon this drawing shall be deemed to be acceptance of these conditions of use unless otherwise agreed in writing, such written agreement to be sought from and issued by the Architects prior to the use or reliance upon this drawing. 2. O'Neill O'Malley Ltd., their agents, Architects, employees or directors shall not be liable for any loss damage or injury consequential or otherwise, howsoever caused for failure to comply with any or all of these conditions. 3. This drawing, the design and contents contained herein are copyright, all rights reserved. No part hereof may be copied or reproduced partially or wholly in any form whatsoever without the prior written consent of the copyright owners O'Neill O'Malley Ltd. 4. The client is granted a copyright licence to use this drawing and its contents for the purpose of which the drawing has been prepared. If this drawing has been produced for construction purposes, the licence will only be valid for a single three dimensional reproduction and shall expire once a single reproduction has occurred. Such a licence only passes to the Client on payment of Architects fees in full and in any event the licence cannot be assigned without the prior written consent of O'Neill O'Malley Ltd. 5. Do not scale off this drawing. Figured metric dimensions only should be taken off this drawing. Imperial dimensions, if any, contained on this drawing are given for illustration purposes only. 6. This drawing is to be relied upon only for the purposes for which it was prepared. This drawing is not to be relied upon for construction purposes and no implied or expressed warranty is given as to the suitability for construction purposes unless the drawing is stated to be for construction purposes. 7. All contractors, whether main or sub-contractors, must visit the site and are responsible for taking and checking any and all dimensions and levels that relate to the works. 8. Where this drawing contains discrepancies in relation to other relevant documents, such discrepancies shall be brought to the attention of the Architects who shall issue a written instruction as to which information is to be followed, and until such Architects instruction has been issued any work carried out on foot of the discrepancies shall be unauthorised. 9. References to National standards, whether to Irish (IS) British (BS) or otherwise, or codes of practice (CP) shall be deemed to refer to the relevant standard or code current at the date of issue of the drawing not withstanding any reference to the contrary or to any earlier standard. 10. Any reference to the "Architect" or "Architects" on this or any other relevant document shall be construed to apply to a director of O'Neill O'Malley Ltd, who has been nominated as the partner-in-charge or to the nominated project Architect but only while such Architect remains in the employment of O'Neill O'Malley Ltd. 11. Any questions as to the meaning or application of these conditions shall be submitted in writing to the Architect for his ruling and such a ruling shall be conclusive as to the meaning or application of these conditions. 12. All information shown relating to existing structure and construction detail is preliminary and subject to 'opening up' and confirmation by the contractor. Any discrepancies are to be referred to the Architect. 13. Proprietary items shall be fixed in strict accordance with manufacturers instructions. 14. Sizes of proprietary items shall be checked with manufacturer and checked for compliance with design detail. 15. Contractor is responsible for procuring any proprietary items required/specified with due attention to 'lead-in' times ensuring compliance with programme dates.

No.	Date	Comments	By

REVISIONS

No.	Date	Comments	By

REVISIONS

Scale: 1:1000
Drawing Purpose: PLANNING
Project: Proposed Development at Rosshill, Galway City
Client: Kegata Ltd.
Date: December 2019
Drawn by: sor
Checked by: JOM
Paper size: CTB file: LTScale:
File path:

File Ref. 3.09 | Subject: MASTER SITE LAYOUT PLAN - FINALISED RED LINE | Project No. 18128 | Drawing No. 3002 | Rev. -

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The northwest corner of the site is prone to occasional pluvial flooding and therefore there is additional storage provided by means of an open attenuation in the form of a swale.

All soakaways are designed to accommodate a 1 in 100 year storm event throughout the site. The networks to the west of the site are designed to accommodate the 1 in 100 year storm event with an overflow being provided which will allow any additional volume of storm water to convey to the naturally forming swale to the north of the site.

The details of the proposed surface water drainage system are shown on the Drainage Layout Drawing in Appendix 3.

2.2.2 Wastewater Services

Wastewater will flow via gravity to a pumping station to the north west of the site and discharge via a rising main to an existing Irish Water pumping station located at Merlin Park. Merlin park pumping station is currently on the Irish Water list of proposed upgrade works which will allow for the catering of additional discharge, however Irish Water have confirmed that that the proposed connection to the Irish Water Network can be facilitated. A letter confirming the above has been provided by Irish Water and is included in Appendix 4 of this NIS. The foul loadings for the sewers have been evaluated in accordance with the Irish Water Code of Practice for Wastewater Supply.

The rising main will transverse through the site, located within the roads, and connect to an existing rising main on the Rosshill road which was laid during the construction of an adjacent development. The gravity sewers have been sized sufficiently to cater for future possible development to the south of the site. The maximum pipe diameter is 225mm, with a maximum and minimum gradient of 1/20 and 1/200. All velocities at these gradients fall within the limits of 0.75 and 3m/sec as set out in “Recommendations for Site Development Works” as published by the Department of Environment. The pumping station has been designed in accordance with the requirements set out in the Irish Water specification for wastewater systems.

The details of the proposed foul water network are shown on the Drainage Layout Drawing in Appendix 3.

2.2.3 Landscaping

A landscape plan has been prepared for the development site (Landscape Master Plan Drawing Appendix 5). The overriding aim of the landscape plan is to retain the best of the existing trees present on site. The plan incorporates the retention of existing woodland and trees where possible and the recreation of similar features through tree, hedgerow and native woodland planting in the new development.

The landscape plan also allows for the integration of a linear parkland along the northern and western boundaries, facilitating continuous off road pedestrian linkage between the southwest and north eastern corners of the site. This will consist of an access path which will be constructed using a minimalist intervention approach to ensure the preservation of woodland trees. The path will be constructed using a non-dig method using a combination of timber sleepers, cellweb system and gravel to ensure increased access to the root protection areas of the trees occurs in a manner not detrimental to the trees. The pathway will be constructed in a meandering manner so as to avoid the felling of existing trees.

2.2.4 Flood Risk Assessment

A Flood Risk Assessment (FRA) has been prepared for the proposed development and is included in Appendix 6. There are no rivers or streams in the vicinity of the site. The Western CFRAM Study indicative flood mapping of the area does not show the site as liable to fluvial flooding.

The FRA concluded:

> "*It is estimated that the risk of flooding the proposed residential development will be minimal, and it is predicted that the development will not increase the risk of flooding elsewhere*".

3. BASELINE ECOLOGY OF THE SITES

In relation to Galway Bay Complex SAC the screening assessment identified a potential pathway for indirect effects on the marine/surface water dependent Qualifying Interests. This was identified in the form of deterioration of water quality resulting from pollution, associated with the construction and operational phases of the development. The qualifying Interests with the potential to be impacted include:

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

Taking a precautionary approach, a potential pathway for effects on harbour seal and otter via disturbance during the construction and operational phases was also identified.

In relation to Inner Galway Bay SPA, a potential pathway for indirect effects on the surface water dependent Qualifying Interests 'Wetlands and Waterbirds [A999] was identified in the form of deterioration of surface water quality resulting from pollution associated with the construction and operational phases of the development.

Taking a precautionary approach, a potential pathway for effect on Inner Galway Bay SPA via disturbance/displacement of the SCI bird species during the construction and operational phases of the development was also identified. The SCI bird species for which Inner Galway Bay SPA has been designated are listed below:

- 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]

The sections below describe the details of the desk study and field surveys undertaken to inform this assessment regarding the "Screened in" Sites and associated Qualifying Interests/Special Conservation Interests.

3.1 Desk Study

3.1.1 EPA River Catchments & Watercourses

The indirect pathway for impact on Galway Bay Complex SAC and Inner Galway Bay SPA is via surface waters.

The proposed development is situated entirely within the EPA River Catchment 29, Galway Bay, South East River Catchment (https://gis.epa.ie/EPAMaps/). There are no adjacent natural or man-made watercourses within the proposed development boundary. The nearest watercourse (EPA Code: 29C05, lies >3km to the east of the proposed development site.

3.1.2 Annex I habitats of Galway Bay Complex SAC

3.1.2.1 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 Objectives (SSCOs) document (NPWS 2013). According to the SSCOs (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 approximately 120m south-west of the proposed project site.

3.1.2.2 Coastal lagoons [1150]

The extent of this habitat is illustrated on Map 4 of the SSCOs document (NPWS 2013). The nearest mapped extents of this habitat are at Lough Atalia, approximately 2.86km to the north-west of the site and Turreen Lough, approximately 2.87km to the south-east of the site.

3.1.2.3 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 mapped extent of this habitat is located approximately 851m south of the proposed project site.

3.1.2.4 Reefs [1170]

The extent of this habitat is illustrated on Map 6 of the SSCOs (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 approximately 120m south-west of the proposed project site.

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

The extent of this habitat is illustrated on Map 9 of the SSCOs (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. According to Map 9 of the SSCOs, the nearest mapped extent to the proposed development site is

approximately 550m south-west of the proposal. According to the site-specific conservation objectives (NPWS, 2013), further unsurveyed examples of this habitat may occur within the SAC.

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

The extent of this habitat is illustrated on Map 9 of the SSCOs (NPWS 2013). According to the SSCOs (NPWS, 2013) the extent of this habitat within Galway Bay Complex SAC is estimated as 114.612ha, based on data from the Saltmarsh monitoring Project (SMP) (McCorry and Ryle, 2009). This habitat was recorded at ten of the ten sub-sites surveyed with Galway Bay Complex SAC. The nearest mapped extent to the proposed project site is approximately 177m to the west of the site.

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

The extent of this habitat is illustrated on Map 9 of the SSCOs (NPWS 2013). According to the SSCOs (NPWS, 2013) the extent of this habitat within Galway Bay Complex SAC is estimated as 114.472 ha, based on data from the Saltmarsh monitoring Project (SMP) (McCorry and Ryle, 2009). This habitat was recorded at six sub-sites surveyed within Galway Bay Complex SAC. The nearest mapped extent to the proposed project site is approximately 5.6km south of the site.

3.1.3 Annex II species of Galway Bay Complex SAC

3.1.3.1 Otter [1355]

The extent of terrestrial commuting otter habitat is illustrated on Map 11 of the SSCOs (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 104m south-west of the proposed project site. The SSCO document notes the importance of maintaining connectivity between commuting routes.

3.1.3.2 Harbour Seal [1365]

The extent of Seal habitat and breeding, moulting and resting sites is illustrated on Map 12 of the SSCOs 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). The nearest breeding site to the proposed development is located approximately 1.3km to the west of the development site as mapped in Map 12 of the SSCOs.

3.1.4 Wetlands of Inner Galway Bay SPA

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 extracts have been gleaned 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".

3.1.5 SCI Species of Inner Galway Bay SPA

Species listed as Special Conservation Interests (SCIs) for Inner Galway Bay SPA and their population type as listed in the Natura 2000 standard data form are listed in Table 3.1.

Table 3-1: SCIs of Inner Galway Bay SPA (004031) and their population type

Special Conservation Interests	Population type
Common Gull (Larus canus) [A182]	Wintering
Great Northern Diver (Gavia immer) [A003]	Wintering
Cormorant (Phalacrocorax carbo) [A017]	Reproducing
Grey Heron (Ardea cinerea) [A028]	Not listed
Light-bellied Brent Goose (Branta bernicla hrota) [A046]	Wintering
Wigeon (Anas penelope) [A050]	Wintering
Teal (Anas crecca) [A052]	Wintering
Shoveler (Anas clypeata) [A056]	Wintering
Red-breasted Merganser (Mergus serrator) [A069]	Wintering
Ringed Plover (Charadrius hiaticula) [A137]	Wintering
Golden Plover (Pluvialis apricaria) [A140]	Wintering

Special Conservation Interests	Population type
Lapwing (Vanellus vanellus) [A142]	Wintering
Dunlin (Calidris alpina) [A149]	Wintering
Bar-tailed Godwit (Limosa lapponica) [A157]	Wintering
Curlew (Numenius arquata) [A160]	Wintering
Redshank (Tringa totanus) [A162]	Wintering
Turnstone (Arenaria interpres) [A169]	Wintering
Black-headed Gull (Chroicocephalus ridibundus) [A179]	Wintering
Sandwich Tern (Sterna sandvicensis) [A191]	Reproducing
Common Tern (Sterna hirundo) [A193]	Reproducing

A review of the Inner Galway Bay conservation objectives supporting document (version 1, NPWS, 2013) pertaining to the SPA was conducted. This document indicates that the subsite Rosshill (0G496), which is located approximately 100m to the west of the development as shown in the maps in Appendix 6 of the conservation objectives supporting document, was surveyed as part of the Inner Galway Bay Survey Programme 2009/10. Data indicates that this subsite is among the more species poor of the subsites surveyed, with mean numbers of 9 and a peak of 12 species recorded on one low tide occasion. A summary of data collect over four surveys of the site at low tide is presented in Table 3.2.

Table 3-2: Inner Galway Bay SPA subsite assessment survey 2009/2010

Species	Total numbers
Common Gull (*Larus canus*)	Low
Great Northern Diver (*Gavia immer*)	Not recorded
Cormorant (*Phalacrocorax carbo*)	Not recorded
Grey Heron (*Ardea cinerea*)	Not recorded
Light-bellied Brent Goose (*Branta bernicla hrota*)	Not recorded
Wigeon (*Anas penelope*)	Low
Teal (*Anas crecca*)	High
Shoveler (*Anas clypeata*)	Not recorded
Red-breasted Merganser (*Mergus serrator*)	Not recorded
Ringed Plover (*Charadrius hiaticula*)	Not recorded
Golden Plover (*Pluvialis apricaria*)	Not recorded

Species	Total numbers
Lapwing (*Vanellus vanellus*)	Low
Dunlin (*Calidris alpina*)	Low
Bar-tailed Godwit (*Limosa lapponica*)	Moderate
Curlew (*Numenius arquata*)	High
Redshank (*Tringa totanus*)	Medium
Turnstone (*Arenaria interpres*)	Not recorded
Black-headed Gull (*Chroicocephalus ridibundus*)	Medium
Sandwich Tern (*Sterna sandvicensis*)	Not recorded
Common Tern (*Sterna hirundo*)	Not recorded

The Inner Galway Bay conservation objectives supporting document does not identify the Rosshill subsite as an important roosting site for any bird species.

3.2 Field Surveys

3.2.1 Methodology

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 proposed project proceeding. Ecological baseline conditions are those existing in the absence of proposed activities (CIEEM, 2018).

A multidisciplinary walkover survey was conducted on the 16th of April 2019 in line with NRA (2009) guidelines (*Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes*) by Sarah Mullen (BSc., Ph.D.) and Claire Stephens (B.Sc.) of MKO.

During the site walkover a bird survey and wetland bird habitat suitability survey of the development site was undertaken. The western boundary of the site, which is in proximity to Galway Bay Complex SAC was also surveyed for otter. A seal habitat suitability survey was also undertaken.

The site was revisited on the 9th July 2019 by Sarah Mullen. During this visit, 2m x 2m relevés were taken in all grassland habitats within the site and a 10m x 10m relevé was taken within woodland habitat. Relevé data is included in Appendix 7 of this report. The surveys were undertaken within the optimal time of year to undertake a habitat and flora survey (Smith *et. al* 2011) and all habitats within and adjacent to the proposed project site were readily identifiable during the site visit.

3.2.2 Results

3.2.2.1 Habitats

The majority of the site comprises a network of semi-improved, species poor *Dry neutral grassland (GS1)* (Plate 3.1). Other grassland habitats present included a small area of poorly-drained grassland at the

north-west of the site, classified as *Wet grassland (GS4)* (Plate 3.2) and a disturbed are in the north-east corner of the site classified as *Dry calcareous and neutral grassland (GS1)* (Plate 3.3). Evidence of grazing by horses was recorded during the site visit in July 2019.

Scattered native and non-native trees are present throughout the site including alder (*Alnus glutinosa*), hawthorn (*Crataegus monogyna*), pine (*Pinus* sp.) and spruce (*Picea* sp.) (Plate 3.4).

Treelines (WL2), comprised predominantly of mature and immature ash (*Fraxinus excelsior*), sycamore (*Acer pseudoplatanus*) and beech (*Fagus sylvatica*) demarcate the boundaries of the development site (Plate 3.5). Field boundaries within the site are delineated by stone walls classified as *Stonewalls and other stonework (BL1), Treelines (WL2)* and *Hedgerows (WL1).*

An area of *Oak-ash-hazel woodland (WD1)* (Plate 3.6). is present along the northern boundary of the development site towards the west of the site. Species present included ash, sycamore, beech (*Fagus sylvatica*), hawthorn, hazel and occasional holly *(Ilex aquifolium*). An area of *Scrub (WS1)* with treelines to its north and south is present to the west of the woodland area.

The ruins of an old building are present within the centre of the site. The remaining stone walls of the ruined building are categorised as *Stonewalls and other stonework (BL1). Scrub (WS1)*, and mature ash (*Fraxinus excelsior*) trees, are present in proximity to this area (Plate 3.7).

Galway Bay Complex SAC is located approximately 5m from the western boundary of the proposed development site. The boundary between the development site and the SAC consists of a mature beech treeline and stone wall. The habitats within the SAC consist of oak-ash-hazel woodland and do not conform to Annex I status.

No Annex I habitats or supporting habitat for Annex II species associated with Galway Bay Complex SAC were identified within the proposed development site. Inner Galway Bay SPA is located approximately 95m to the west of the development. No supporting wetland habitat for SCI bird species associated with the SPA was identified within the proposed development site.

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

Plate 3-1: The majority of the site is comprised of semi-improved Dry neutral grassland (GS1).

Plate 3-2: Wet grassland (GS4) to the north-west of the site.

Plate 3-3: Dry calcareous and neutral grassland (GS1) in the north-east corner of the site.

Plate 3-4: Scattered trees towards the south-east of the development site.

Plate 3-5: Mature beech Treeline (WL2) delineating the western boundary of the development site.

Plate 3-6: Oak-ash-hazel woodland (WN2) within the development site close to the northern boundary.

Plate 3-7:Buildings and artificial surfaces (BL3); silage pit constructed within the site of a habitat within stone walls (BL1) remaining from a building in ruin with areas of scrub (WS1) within the development site boundary.

3.2.2.2 Invasive Species

The non-native invasive species, Spanish Bluebell Hybrid (*Hyacinthoides hispanica)* was recorded growing at one location close to the southern boundary of the development site (Plate 3.8). This species is listed on the 'Third Schedule' of Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011).

Plate 3-8: The non-native invasive species Spanish Bluebell (Hyacinthoides hispanica) was recorded growing at one location close to the southern boundary of the development site.

3.2.2.3 Significance of Habitats

The habitats within and adjacent to the development site were evaluated in accordance with the criteria developed by the National Roads Authority (NRA) –outlined in *Guidelines for Assessment of Ecological Impacts of National Road Schemes* (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).

None of the habitats within the works areas correspond to habitats listed on Annex I of the EU Habitats Directive.

The species poor ***dry neutral grassland (GS1), wet grassland (GS4), Buildings and artificial surfaces (BL3)*** and vegetated ***Stonewalls and other stonework (BL1)*** habitats within the proposed project site were assigned *Local Importance (Lower Value)* as they are of low ecological significance and abundant in the wider area.

The area of ***Dry calcareous and netural grassland (GS1)*** in the disturbed, north-eastern corner of the site was assigned *Local importance (lower value)*. The area has been disturbed in the recent past and consists of imported rubble and rocks. The recolonising grassland area is small (0.5). 1 no. 2m x 2m relevé was taken in this habitat. Given the low number of positive indicator species the grassland was not found to correspond to Annex I grassland habitat (refer to Relevé data Appendix 7).

The ***Scrub (WS1), Hedgerow (WL1)*** and ***Treeline (WL2)*** habitats were assigned *Local Importance (Higher Value)* as they help maintain links and ecological corridors between features of higher ecological value and are likely to be utilized by commuting and foraging bats.

The area of ***Oak-ash-hazel woodland (WN2)*** was also assigned *Local Importance (Higher Value).* Although small in area it helps maintain links to nearby larger areas of woodland. The woodland

consisted of a mix of ash, sycamore and beech. 1 no. 10m x 10m relev was undertaken in this habitat and the habitat was not found to correspond to any Annex I woodland habitat (refer to Relevé data Appendix 7).

Habitat mapping undertaken for the N6 Galway City Transport Project (GCTP) was reviewed. The habitats within the development site were not assessed as part of the project (GCTP, 2015).

3.2.2.4 Fauna

An otter survey of the proposed development site was undertaken. No evidence of otter was identified and the site does not support suitable habitat for otter. There are no watercourses within the proposed development site which could be utilised by otter and the site does not contain any coastline, lagoons, ponds or marsh. The shoreline of Galway Bay is buffered from the proposed development by woodland and agricultural grassland.

A habitat suitability survey for harbour seal was also undertaken. The site does not support suitable habitat for this species and according to the SSCOs the nearest known breeding site is approximately 1.3km from the proposed development

A bird survey and habitat suitability survey for wetland birds associated with Inner Galway Bay SPA was undertaken. None of the SCI bird species for which the SPA is designated were recorded within the development site during the site visits undertaken in April and July 2019. The site consists predominantly of semi-improved grassland. The site does not support any wetland habitat and does not provided potential breeding or roosting habitat for SCI species. Furthermore the development is buffered from suitable wetland habitat within the SPA by woodland, residential dwellings and agricultural grassland.

3.2.2.5 Significance of the Fauna

Faunal populations or supporting habitat for faunal species associated with EU sites were not recorded.

4. ASSESSMENT OF POTENTIAL IMPACTS

4.1 Galway Bay Complex SAC

4.1.1 Review of Conservation Objectives for Galway Bay Complex SAC

The relevant QIs and the associated conservation objectives of the site are presented in Table 4.1. The Targets and Attributes for the relevant habitats and species, as described in the Galway Bay Complex SAC Conservation Objectives supporting documents, were reviewed and considered in this assessment. The targets and attributes for the relevant QIs are included in Appendix 8 of this NIS.

Table 4-1: Qualifying Interest and Conservation Objectives (Version 01, 2013)

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.
Coastal lagoons [1150]	To restore the favourable conservation condition of Coastal lagoons not covered by seawater at low tide in Galway Bay Complex SAC.
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.
Large shallow inlets and bays [1160]	To maintain the favourable conservation condition of Large shallow inlets and bays in Galway Bay Complex SAC
Atlantic salt meadows (*Glauco-Puccinellietalia maritimae)* [1330]	To restore the favourable conservation condition of Atlantic salt meadows (*GlaucoPuccinellietalia 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
Lutra lutra (Otter) [1355]	To restore the favourable conservation condition of Otter in Galway Bay Complex SAC.
Phoca vitulina (Harbour seal)	To maintain the favourable conservation condition of Harbour Seal in Galway Bay Complex SAC.

4.1.2 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:

- J02.01.02 – Reclamation of land from sea, estuary or marsh (Medium)
- E03.03 – Disposal of inert materials (Low)
- A02.01 – Agricultural intensification (Medium)
- D03 - Shipping lanes, ports, marine constructions (High)
- G01.01.02 – Non-motorized nautical sports (Low)
- A04.02.02 - Non- intensive sheep grazing (Medium)
- G02.01 - Golf course (Low)
- D03.01.01 - Slipways (Low)
- H01.08 - Diffuse pollution to surface waters due to household sewage and waste waters (High)
- J02.05.01 - Modification of water flow (tidal & marine currents) (Low)
- D01.01 - Paths, tracks, cycling tracks (Low)
- H01.05 - Diffuse pollution to surface waters due to agricultural and forestry activities (High)
- F01 – Marine and freshwater aquaculture (Medium)
- I01 – Invasive non-native species (Medium)
- C01.01 - Sand and gravel extraction (Medium)
- F06 – Hunting, fishing or collecting activities (Medium)
- F02.03.01 - Bait digging / collection (Low)
- J02.02.02 – Estuarine and coastal dredging (Low)
- D02.02 – Pipelines (Medium)
- C01.01.02 – Removal of beach materials (Medium)
- D03.01.04 – Industrial ports (High)
- J02.12.01 - Sea defence or coast protection works, tidal barrages (High)
- A04.02.01 (Non-intensive cattle grazing)

The proposed project relates to the construction of a housing estate at Rosshill, Co. Galway. *H01.08 diffuse pollution to surface waters due to household sewage and waste waters (High)* is identified above and is 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.

4.2 Inner Galway Bay SPA

4.2.1 Review of Conservation Objectives for Inner Galway Bay SPA

The relevant SCIs and the associated conservation objective of the site are presented in Table 4.2. The Targets 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[1]).

[1] *NPWS, 2013, Inner Galway Bay Special Protection Area; Conservation Objectives Supporting Document VERSION 1*

The targets and attributes for the for the SCIs are included in Appendix 8 of this NIS.

Table 4-2: Special Conservation Interests and Conservation Objectives (Version 01, 2013)

Special Conservation Interest	Conservation Objective (Version 01, May 2013)
Great Northern Diver (*Gavia immer*) [A003]	*To maintain the favourable conservation condition of the bird species as Special Conservation Interests for this SPA.*
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]	*'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.'*

4.2.2 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:

- E03 - Discharges (High)
- G01.02 – Walking, horseriding and non-motorised vehicles (Medium)
- F01 – Marine and freshwater aquaculture (Medium)
- F02.03 – Leisure fishing (Medium)
- G01.01 – Nautical sports (Medium)
- E01 – Urbanised areas, human habitation (High)
- D01.02 – Roads, motorways (Medium)
- E02 – Industrial or commercial areas (Medium)
- F03.01 – Hunting (Low)
- J02.01.02Reclamation of land from sea, estuary or marsh (High)
- A08 – Fertilisation (Medium)
- A04 - Grazing (Low)
- J02.12 – Dykes, embankments, artificial beaches, general (Medium)

E03 Discharges (High) and *E01 Urbanised areas/human habitation* (High) have been identified as having potential to impact on the SCI bird species and the SCI feature Wetlands [A999] for which the SPA has been designated. These activies have the potential to result in pollution to surface waters and disturbance of bird species.

The screening assessment of the proposed project, see Table 3.1, identified potential for water pollution associated with the construction phase and operational phases of the development.

4.3 Assessment of Pathways for Adverse Effect

This Natura Impact Statement presents the data and information on the project and provides an analysis of the potential adverse effects on the aforementioned EU designated sites. Potential adverse effects are assessed in view of best scientific knowledge, on the basis of objective information in relation to the proposed housing development including proposed avoidance, reduction and preventive measures.

4.3.1 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 proposed project as the development site is located entirely outside of any EU Designated Site. There is no supporting habitat for any SCI/QI species associated with Galway Bay Complex SAC or Inner Galway Bay SPA in the development site and there will be no impact on supporting habitat areas outside the development site boundary. There is also no direct surface water connectivity between the site of the proposed project and any EU Designated Site.

4.3.2 Potential for Indirect Effects on the European Sites

4.3.2.1 Identified Pathway for Impact – Deterioration in water quality

A potential pathway for indirect effects on the marine/surface water dependent Qualifying Interests of Galway Bay Complex SAC and Inner Galway Bay SPA was identified in the form of deterioration of water quality resulting from pollution, associated with the construction and operational phases of the development.

4.3.2.2 Preventative measures to avoid identified impact

Best practice environmental control measures have been incorporated in the design of the development and are described in the following subsections.

4.3.2.2.1 *Construction Phase*

The construction of the development will involve excavations and earth moving which create the potential for pollution in various forms, i.e. the generation of suspended solids and the potential for spillage of fuels associated with the refuelling of excavation machinery. There is a risk of surface water runoff from bare soil and soil storage areas during construction works.

There are no adjacent natural or man-made watercourses within the proposed development boundary. However, in the absence of mitigation, the construction activities could result in the overland release of suspended solids. Taking a precautionary approach the release of suspended solids could potentially affect the water quality of downstream water bodies and water dependent habitats of Galway Bay Complex SAC and Inner Galway Bay SPA.

4.3.2.2.2 *Mitigation*

Best practice environmental control measures will be implemented during the construction phase of the development. These are described below:

On site surface water runoff

- A CEMP has been prepared for the proposed development and is included as Appendix 9 of this NIS. The CEMP incorporates the mitigating principles to ensure that the work is carried out in a manner which blocks all potential pathways for adverse water quality impacts. The CEMP will be in place prior to the start of the construction phase of the project.
- Prior to the commencement of earthworks, silt fencing will be placed down-gradient of the construction areas. Fences will be embedded into the local soils to ensure all site water (should any arise) is captured and filtered;
- As construction advances there may be a small requirement to collect and treat surface water within the site. This 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;
- 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;
- Daily monitoring and inspections of site drainage during construction will be completed;

- Earthworks will take place during periods of low rainfall to reduce run-off and potential siltation of watercourses;
- Good construction practices such wheel washers and dust suppression on site roads, and regular plant maintenance will ensure minimal risk. The Construction Industry Research and Information Association (CIRIA) provide guidance on the control and management of water pollution from construction sites ('Control of Water Pollution from Construction Sites, guidance for consultants and contractors', CIRIA, 2001), which provides information on these issues. This will ensure that surface water arising during the course of construction activities will contain minimum sediment.

Hydrocarbons

The use of hydrocarbons during the construction process can result in the potential for pollution and accidental spillage to groundwater. The following measures have been built into the construction design phase of the project.

- On site re-fuelling of machinery will be carried out using a mobile double skinned fuel bowser.
- Only designated trained and competent operatives will be authorised to refuel plant on site.
- Vehicles will never be left unattended during refuelling
- Mobile measures such as drip trays and fuel absorbent mats will be used during all refuelling operations;
- Fuels stored on site will be minimised. Any storage areas will be bunded appropriately for the fuel storage volume for the time period of the construction;
- The plant used will be regularly inspected for leaks and fitness for purpose;
- Spill kits will be available to deal with accidental spillages.

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).
- Requirements for the protection of fisheries habitat during construction and development works at river sites developed by the ERFB. http://www.fisheriesireland.ie/Research/recent-publications.html.

4.3.2.2.3 *Operational Phase*

Production of Foul Sewage

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

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. (Refernce City Plan)."

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 3880706469 is provided in Appendix 4 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 EPA standards; no potential for adverse impact on water quality exists.

Surface Water Runoff

All stormwater generated on site from roadways and roofs will discharge via an oil/petrol interceptor to one of 12 no. proposed soakaways which are strategically situated throughout the site. The stormwater will soak away through the underlying fractured rock/boulders. The soakaways are constructed of a cellular storage unit providing 95% porosity or stone filled soakaway providing 40% void ratio. These will also attenuate storm water during and post storm events prior to infiltrating through the underlying fracture rock/boulders.

The northwest corner of the site is prone to occasional pluvial flooding and therefore there is additional storage provided by means of an open attenuation in the form of a swale.

All soakaways are designed to accommodate a 1 in 100 year storm event throughout the site. The networks to the west of the site are designed to accommodate the 1 in 100 year storm event with an overflow being provided which will allow any additional volume of storm water to convey to the naturally forming swale to the north of the site.

No potential for adverse impact on water quality exists as a result of the storm water treatment proposal.

4.3.2.3 Disturbance and Displacement - Otter and harbour seal

No evidence of harbour seal was identified within the development site and the site does not contain suitable habitat for this species. The section of Galway Bay Complex SAC adjacent to the development site is wooded and does not provide suitable habitat for this species. According to the SSCOs for Galway Bay Complex SAC the nearest mapped breeding site is 1.3km from the development. Given the distance between the development and the nearest known breeding site and the intervening natural buffers including woodland, grassland and residential dwellings, no potential for disturbance related impact on harbour seal exists.

Although no evidence of Otter was recorded during the dedicated surveys, potential supporting habitat for the species exists in the wider area and the potential for disturbance to the Otter population associated with Galway Bay Complex SAC is considered below on a precautionary basis.

Otter are crepuscular in nature and are unlikely to be adversely impacted by the proposed works. The NPWS Threat Response Plan for Otter acknowledges that "*Little evidence has come to light in recent studies to suggest that disturbance by recreation is a significant pressure.*" It also identifies that Otter are known to travel significant distances from streams and lakes in search of new territory and feeding areas.

Channin P (2003) provides a literary review with regard to anthropogenic disturbance and refers to several reports which have found that disturbance is not detrimental to Otters (Jefferies (1987), (Durbin

1993). (Green & Green 1997). The report also describes successful breeding in towns, under ferry terminals and under the jetties of one of Europe's largest oil and gas terminals at Sullom Voe in North Scotland.

Irish Wildlife Manual No 23 (National Otter Survey of Ireland 2004/2005) found no significant relationship between disturbance and otter occurrence. In addition, no significant difference in otter presence was found between sites with and without recreational activity. It also states, "*the lowest percentage occurrence was found at the sites with the lowest recorded disturbance!"*

Irish Wildlife Manual No 76 (*National Otter Survey of Ireland 2010/2012*) notes that the occurrence of Otter was unaffected by perceived levels of disturbance at the survey sites. It also notes that there is little published evidence demonstrating any consistent relationship between Otter occurrence and human disturbance (Mason & Macdonald 1986, Delibes et al. 1991; Bailey &Rochford, 2006).

Best practice disturbance limitation measures have been included in the project design and are described below.

Based on the above review of scientific literature, given that no otter evidence was recorded during dedicated surveys and based on the best practice disturbance limitation measures included below, the potential for adverse impact on the integrity of the otter population associated with Galway Bay Complex SAC can be excluded.

4.3.2.3.1 Mitigation

Best practice disturbance limitation measures will be implemented during the construction phase of the development. These are described below:

The methodology of British Standard WS 5228: l997 "Noise and Vibration Control on Construction and Open Sites" Part I, will be deployed during works, to minimise emission of any noise. In addition, the following best practice measures will be deployed:

- Work will be completed during daylight hours. No artificial lighting will be used to illuminate any works area.
- The best means practical, including proper maintenance of plant, will be employed to minimise the noise produced by on-site operations.
- All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the contract.
- Compressors will be of the "sound reduced" models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers.
- Machines which are used intermittently will be shut down or throttled back to a minimum during those periods when they are not in use.
- Any plant such as generators or pumps which are required to work outside of normal working hours will be surrounded by an acoustic enclosure.

4.3.2.3.2 Disturbance and Displacement -Birds

Taking a precautionary approach, disturbance and displacement were identified as having the potential to result in adverse effects on the following Qualifying Interests of the Inner Galway SPA:

-
- 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

An assessment of the potential effects on these SCI species in respect of disturbance and displacement impacts is provided below and is based on a detailed desk study of recent scientific literature described. The potential for adverse effects on these species in view of their site-specific conservation objectives have been considered in this assessment.

Inner Galway Bay SPA lies approximatley 95 metres to the west of the development site. None of the listed SCI species of Inner Galway Bay SPA were recorded utilising habitats within the development site during the site visits undertaken in April 2019 and July 2019. The site consists predominantly of semi-improved grassland. The site does not consist of any wetland habitat and does not support suitable breeding habitat for any of the breeding SCI species for which the SPA is designated. Furthermore, the SPA is extensively buffered from the development site by woodland, residential dwellings and agricultural grassland.

Whilst no significant disturbance to these SCI bird species is anticipated during construction or operation, an assessment of the distance at which birds respond to human disturbance (flight initiation distance or FID) was undertaken for each of the SCI species. Flight initiation distances for each of the SCI species listed for Inner Galway Bay SPA are provided in Table 4.3 based on a review of the most recent scientific literature. Livezey et al. (2016) provides a literary review with regard to bird flight initiation distances in response to anthropogenic disturbance. The study compiles a database of published alert distances (distances at which birds exposed to an approaching human activity exhibit alert behavior), flight initiation distances (distances at which birds exposed to an approaching human activity initiate escape behavior), and minimum approach distances (distances at which humans should be separated from wildlife) by taxonomic order. This table demonstrates that the proposed development is outside the disturbance distance for any SCI species of Inner Galway Bay SPA. The most sensitive species are potentially disturbed at 71metres. The proposed development is over 90 metres from the SPA and separated from it by woodland, treelines, grassland and residential dwellings. Based on the above literary review and lack of supporting habitat for SCI species at the development site no potential for adverse disturbance effects on the SCI species of Inner Galway Bay, either within or outside the SPA boundary, are anticipated.

Table 4-3: Disturbance Distance of SCI species of Inner Galway Bay SPA

SCI Species of Inner Galway Bay	Population type	Inner Galway Bay SPA subsite assessment survey 2009/2010: Total numbers	Minimum Approach Distance to pedestrian disturbance by taxonomic order	SCI Species of Inner Galway Bay
Common Gull	Wintering	High	22.3m	59.9m in response to pedestrian disturbance (Møller & Erritzøe, 2010)
Great Northern Diver	Wintering	Not recorded	Not listed	76.8m in response to human recreational activity (Jiang and Møller, 2017). A study of the disturbance response of great northern diver to boat traffic in Inner Galway Bay, found that Great Northern Divers in the area around Galway harbour do not show any significant response to normal ship and boat traffic with no Great Northern Divers flushed by the survey boat, even though the boat passed within 10 to 20 m of some birds (Gittings et al. 2015).
Cormorant	Reproducing	High	32.1m	23.5m, in response to motorized vehicle, and 74m, in response to pedestrian disturbance in non- nesting birds (Guay et al., 2014)
Grey Heron	Not listed	Very high	46.8m	47.36m in response to pedestrian disturbance (Møller & Erritzøe, 2010)
Light-bellied Brent Goose	Wintering	Not recorded	71.0m	105m in response to pedestrian disturbance (Smit & Visser, 1993); 23.5m in response to pedestrian disturbance (Møller & Erritzøe, 2010)

SCI Species of Inner Galway Bay	Population type	Inner Galway Bay SPA subsite assessment survey 2009/2010: Total numbers	Minimum Approach Distance to pedestrian disturbance by taxonomic order	SCI Species of Inner Galway Bay
Wigeon	Wintering	Very high	71.0m	91m (Holloway, 1997)
Teal	Wintering	Very high	71.0m	58m in response to pedestrian disturbance (Møller, 2008b); 39.23m in response to pedestrian disturbance (Møller & Erritzøe, 2010)
Shoveler	Wintering	Low	71.0m	Flush distance 100m in response to vehicles and walking (Pease, 2005).
Red-breasted Merganser	Wintering	Moderate	71.0m	Flush distance 28m in response to human recreational activity (Knapton, 2000).
Ringed Plover	Wintering	Not recorded	42.2m	22.5m in response to pedestrian disturbance (Møller, 2008b); 121m in response to pedestrian disturbance (Smit & Visser, 1993)
Golden Plover	Wintering	Very high	42.2m	
Lapwing	Wintering	Very high	42.2m	41.32m (Møller, 2008b), 39.47m (Møller AP. 2008c) in response to pedestrian disturbance.
Dunlin	Wintering	High	42.2m	163m in response to pedestrian disturbance (Smit & Visser, 1993);
Bar-tailed Godwit	Wintering	High	42.2m	219m in response to pedestrian disturbance (Smit & Visser, 1993); 22.1m in response to pedestrian disturbance (Blumstein et al., 2003)
Curlew	Wintering	Very high	42.2m	90m in response to dog disturbance, 188m in response to car disturbance and 213m in response to pedestrian disturbance (Smit & Visser, 1993)

SCI Species of Inner Galway Bay	Population type	Inner Galway Bay SPA subsite assessment survey 2009/2010: Total numbers	Minimum Approach Distance to pedestrian disturbance by taxonomic order	SCI Species of Inner Galway Bay
Redshank	Wintering	Very high	42.2m	29.71m in response to pedestrian disturbance (Møller, 2008b) (Møller & Erritzøe, 2010)
Turnstone	Wintering	High	42.2m	13.8m in response to pedestrian disturbance (Blumstein et al., 2005), 29.66m (Glover et al., 2011). 47m in response to pedestrian disturbance (Smit and Visser, 1993)
Black-headed Gull	Wintering	High	42.2m	41.20m (Møller and Erritzøe, 2010)
Sandwich Tern	Reproducing	Not recorded	22.3m (nesting) 42.2m	
Common Tern	Reproducing	Not recorded	22.3m (nesting) 42.2m	20.5m in response to pedestrian disturbance (Weston et al., 2012)

4.4 Discussion of Residual Impacts

Based on the above, in view of best scientific knowledge, on the basis of objective information, the proposed project will not adversely affect surface or ground water in the area during either construction or operation of the proposed project. There is no potential for adverse effect on the identified QIs/SCIs and their associated targets and attributes, or on any European Site via this identified pathway, which has been robustly blocked through measures to avoid impacts and the incorporation of best practice/mitigation measures into the project design.

Taking cognisance of measures to avoid impacts and best practice/mitigation measures incorporated into the project design which are considered in the preceding section, the Proposed project will not have an adverse effect on the integrity of any European site.

The proposed project will not prevent the QIs/SCIs of European Sites from achieving/maintaining 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 project will not adversely affect the Qualifying Interests/Special Conservation Interests associated with Galway Bay Complex SAC or Inner Galway Bay SPA.

5. CUMULATIVE EFFECTS

Article 6(3) of the Habitats Directive requires that in-combination or cumulative effects of the project with other plans or projects are considered. A search and review in relation to plans and projects that may have the potential to result in cumulative and/or in-combination impacts on European Sites was conducted during this Natura Impact Statement. This assessment focuses on the potential for cumulative in-combination effects on the QIs for which potential pathway for impact were identified. This includes a review of online Planning Registers and served to identify past and future plans and projects, their activities and their predicted environmental effects.

5.1 Plans

The proposed project lies within land zoned as residential in the Galway City Council Development Plan 2017-2023. The policies and objectives of this plan have already been assessed in the Galway City Development Plan Natura Impact Report (NIR) (RPS, 2016). This report concluded that having incorporated mitigation measures, the GCDP 2017-2023 will not have a significant adverse effect on the integrity of the European sites either individually or in combination with other plans or projects.

The following plans have been reviewed and are taken into consideration as part of this assessment:

- Galway City Council Development Plan 2017-2023,
- The Regional Planning Guidelines for the West 2010-2022,
- Draft Galway County Heritage and Biodiversity Plan 2017-2022,
- Galway BAP 2014 - 2020

The review focused on policies and objectives that relate to European Sites and natural heritage (Table 5.1). No potential for cumulative impacts when considered in conjunction with the current proposal were identified.

Table 5-1: Review of plans

Plans	Key Policies/Issues/Objectives Directly Related To European Sites, Biodiversity and Sustainable Development In The Zone of Influence	Assessment of development compliance with policy
Galway City Council Development Plan 2017-2023	**Policy 4.2 Protected Spaces: Sites of European, National and Local Ecological Importance** Protect European sites that form part of the Natura 2000 network (including Special Protection Areas and Special Areas of Conservation) in accordance with the requirements in the EU Habitats Directive (92/43/EEC), EU Birds Directive (2009/147/EC) and associated national legislation.	The surveys undertaken in the preparation of this application have demonstrated that the proposed project will not adversely affect the Qualifying Interests/Special Conservation Interests associated with Galway Bay Complex SAC or Inner Galway Bay SPA. There will be no adverse effects on sensitive aquatic receptors listed as QIs/SCI, as a result of deterioration in water quality. The proposed project has been designed to avoid any effect on surface or ground water outside the site as set out in Section 5 of this NIS. There will be no adverse effects as a result on disturbance on SCI bird species of Inner Galway Bay SPA.
Variation No.1 to the County Development Plan 2015 - 2021	**Objective DS 6 – Natura 2000 Network and Habitats Directive Assessment** Protect European sites that form part of the Natura 2000 network (Including Special Protection Areas and Special Areas of Conservation) in accordance with the requirements in the EU Habitats Directive (92/43/EEC), EU Birds Directive (2009/147/EC), the Planning and Development (Amendment) Act 2010, the European Communities (Birds and Natural Habitats) Regulations 2011(SI No.477 of 2011) (and any subsequent amendments or updated legislation) and having due regard to the guidance in the Appropriate Assessment Guidelines 2010 (and any updated or subsequent guidance). A plan or project (e.g. proposed	The proposed project will not adversely affect the Qualifying Interests/Special Conservation Interests associated with the Galway Bay Complex SAC or Inner Galway Bay SPA. There will be no adverse effects on sensitive aquatic receptors listed as QIs/SCI, as a result of deterioration in water quality. There will be no adverse effects as a result on disturbance on SCI bird species of Inner Galway Bay SPA.

Plans	Key Policies/Issues/Objectives Directly Related To European Sites, Biodiversity and Sustainable Development In The Zone of Influence	Assessment of development compliance with policy
	development) within the plan area will only be authorised after the competent authority (Galway County Council) has ascertained, based on scientific evidence, Screening for Appropriate Assessment, and/or a Habitats Directive Assessment where necessary, that: a) The plan or project will not give rise to significant adverse direct, indirect or secondary effects on the integrity of any European site (either individually or in combination with other plans or projects); or b) The plan or project will have significant adverse effects on the integrity of any European site (that does not host a priority natural habitat type/and or a priority species) but there are no alternative solutions and the plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature. In this case, it will be a requirement to follow procedures set out in legislation and agree and undertake all compensatory measures necessary to ensure the protection of the overall coherence of Natura 2000; or c) The plan or project will have a significant adverse effect on the integrity of any European site (that hosts a natural habitat type and/or a priority species) but there are no alternative solutions and the plan or project must nevertheless be carried out for imperative reasons for overriding public interest, restricted to reasons of human health or public safety, to beneficial consequences of primary importance for the environment or, further to an opinion from the Commission, to other imperative reasons of overriding public	

Plans	Key Policies/Issues/Objectives Directly Related To European Sites, Biodiversity and Sustainable Development In The Zone of Influence	Assessment of development compliance with policy
	interest. In this case, it will be a requirement to follow procedures set out in legislation and agree and undertake all compensatory measures necessary to ensure the protection of the overall coherence of Natura 2000.	
	Objective DS 10 – Impacts of Developments on Protected Sites Have regard to any impacts of development on or near existing and proposed Natural Heritage Areas, Special Protection Areas and Special Areas of Conservation, Nature Reserves, Ramsar Sites, Wildfowl Sanctuaries, Salmonoid Waters, Refuges for Flora and Fauna, Conamara National Park, shellfish waters, freshwater pearl mussel catchments and any other designated sites including future designations.	The proposed project will not adversely affect the Qualifying Interests/Special Conservation Interests associated with the Galway Bay Complex SAC or Inner Galway Bay SPA. There will be no adverse effects on sensitive aquatic receptors listed as QIs/SCI, as a result of deterioration in water quality. There will be no adverse effects as a result on disturbance on SCI bird species of Inner Galway Bay SPA.
The Regional Planning Guidelines for the West 2010-2022	**EAP13**: To support the protection of Natural Heritage Areas, Special Protection Areas, Special Areas of Conservation, Nature Reserves, Ramsar Sites (Wetlands), Wildfowl Sanctuaries, National Parks, Nature Reserves and the biodiversity designated under the Habitats Directive, Birds Directive, Wildlife Act, Flora Protection Order and other designated or future designated sites.	The proposed project will not adversely affect the Qualifying Interests/Special Conservation Interests associated with the Galway Bay Complex SAC or Inner Galway Bay SPA There will be no adverse effects on sensitive aquatic receptors listed as QIs/SCI, as a result of deterioration in water quality. There will be no adverse effects as a result on disturbance on SCI bird species of Inner Galway Bay SPA.

Plans	Key Policies/Issues/Objectives Directly Related To European Sites, Biodiversity and Sustainable Development In The Zone of Influence	Assessment of development compliance with policy
	EAO18: Support the achievement of favourable conservation status of Annex I habitats, Annex II species, Annex I bird species and other regularly occurring migratory bird species and their habitats in the region.	The proposed project will not adversely affect the Qualifying Interests/Special Conservation Interests associated with the Galway Bay Complex SAC or Inner Galway Bay SPA.
National Biodiversity Action Plan 2017-2021	**Target 6.2 -** Sufficiency, coherence, connectivity, and resilience of the protected areas network substantially enhanced by 2020.	There will be no impact on SCI species of Inner Galway Bay SPA or the QIs of Galway Bay Complex SAC. The proposed project will not impact on connectivity within the wider area. There are no watercourses within the proposed project site that could be used as a commuting corridor. There will be no deterioration in water quality or wetlands of Inner Galway Bay SPA due to the proposed project.

5.2 Other Plans & Projects

The proposed development was considered in-combination with other plans and projects in the area that could result in cumulative impacts on European Sites. The online planning system for Galway City Council, was consulted on the 01/12/2019 for the townland of Rosshill. Additional projects identified in the townland of Rosshill, Roscam are;

- Permission for a new residential development. The development consists of 16 no. 2-storey, five-bedroom, detached houses, together with individual garages, as applicable, new vehicular site accesses and roads with all ancillary site works, landscaping and service connections (16/228)
- Permission to construct 23 two storey Dwelling houses consisting of Detached, Semi-dectached and terrace including access/egress off the old coast road to Oranmore with sewer connection to adjacent sewer pumping station adjacent the Dublin Road and all associated services (17/238).
- Permission for a change of house type to previously granted planning permission (reference 16/228). These amendments consist of a change of house type C (on site 6 only) which is a 5-bedroom two storey detached house (18/187).
- Permission for development which consists of the constructing 51 No. one, two and three bedroom apartments and two one bedroom Town Houses in 6 no. Blocks ranging in height from one storey up to four storey, with sewer connection to adjacent pumping station adjacent Dublin road, together with access/egress off the old coast road to Oranmore and all associated services at Doughiska and Merlin Park Townlands. (Previous Planning Ref No. 17/283) (19/95).

In addition to the above the following developments are also planned within the immediate and wider area:

- Proposed SHD development at Moneyduff, Oranmore, Co. Galway. The proposed development will consist of the construction of 212 no. residential houses, amenity areas, a creche and associated parking facilities.
- A proposed Greenway cycling network runs along the south of the development site. It is a policy of the Galway City Development Plan to continue to develop and improve the greenway network in the city, including to facilitate a linked greenway from the city to the country area including Oranmore. According to the Development Plan, proposed greenways will be subject to a route selection process which will take cognisance of site-specific circumstances including consideration of ecological sensitivity.
- According to the Galway City Development Plan it is planned to develop Murrough, an area to the west of the development, in accordance with a Local Area Plan which will reserve a substantial bank of land for recreational purposes, allow for public access and allow for mixed use development which will create a sustainable neighbourhood and maximise the sustainable development of appropriate recreation facilities.

- The Natura Impact Statement and habitat mapping undertaken for the proposed N6 Galway City Ring Road was also consulted. The NIS concluded that '*following an examination, analysis and evaluation of the relevant information, including in particular the nature of the predicted impacts from the proposed road development and with the implementation of the mitigation measures proposed, that the proposed road, development does not pose a risk of adversely affecting (either directly or indirectly) the integrity of any European Site, either alone or in combination with other plans or projects, and there is no reasonable scientific doubt in relation to this conclusion*'.

The proposed project will not contribute to any water pollution effects. It will not result in any disturbance to any SCI or QI species.

Following the detailed assessment provided in the preceding sections, it is concluded that, the proposed development will not result in any residual adverse effects on any of the European Sites, their integrity or their conservation objectives when considered on its own. There is therefore no potential for the proposed project to contribute to any cumulative adverse effects on any European Site when considered in-combination with other plans and projects.

In the review of the projects that was undertaken, no connection, that could potentially result in additional or cumulative impacts was identified. Neither was any potential for different (new) impacts resulting from the combination of the various projects and plans in association with the proposed development. There are no watercourses located on site that could provide surface water connectivity with other proposed developments in the area. In addition, the best practice measures incorporated into the proposal will ensure that there are no impacts on EU Designated sites, and therefore there is no potential for cumulative impacts to occur.

Taking into consideration any reported residual impacts within NIS's, or other ecological reporting, from other plans and projects in the area and the predicted impacts from the current proposal, there is no likelihood of significant in-combination or cumulative effects between the other plans and projects in the area and the proposed project.

6. CONCLUDING STATEMENT

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

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 proposed project does not adversely affect the integrity of European sites.

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

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APPENDIX 1

APPROPRIATE ASSESSMENT SCREENING REPORT

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Article 6 (3) Appropriate Assessment Screening Report

Proposed Strategic Housing Development, Rosshill, Galway

DOCUMENT DETAILS

Client::	**Kegata Ltd.**
Project title:	**Proposed Strategic Housing Development, Rosshill, Galway**
Project Number:	**181058**
Document Title:	**Article 6 (3) Appropriate Assessment Screening Report**
Document File Name:	**AASR F – 2019.12.16 – 181058-a**
Prepared By:	**MKO** **Tuam Road** **Galway** **Ireland** **H91 VW84**

Planning and Environmental Consultants

Rev	Status	Date	Author(s)	Approved By
01	Final	16/12/2019	SM	JH

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1. INTRODUCTION

1.1 Background

MKO has been appointed to provide the information necessary to allow the competent authority to conduct an Article 6(3) Screening for Appropriate Assessment of a of a proposed strategic housing scheme located on lands at Rosshill Road, Roscam, Co. Galway.

Screening for Appropriate Assessment is required under Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive). Where it cannot be excluded that a project or plan, either alone or in combination with other projects or plans, would have a significant effect on a European Site then same shall be subject to an appropriate assessment of its implications for the site in view of the site's conservation objectives. 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 Screening process.

The assessment in this report is based on a desk study and field surveys undertaken during 2019. It specifically assesses the potential for the proposed development to result in significant effects on European sites in the absence of any best practice, mitigation or preventative measures.

This Appropriate Assessment Screening Report has been prepared in accordance with the European Commission's *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 *Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC* (EC, 2018) as well as the Department of the Environment's *Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities* (DoEHLG, 2010).

In addition to the guidelines referenced above, the following relevant documents were also considered in the preparation of this report:

1. *Council of the European Commission (1992) Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora. Official Journal of the European Communities. Series L 20, pp. 7-49.*
2. *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.*
3. *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.*
4. *EC (2013) Interpretation Manual of European Union Habitats. Version EUR 28. European Commission.*

1.2 Appropriate Assessment

1.2.1 Screening for Appropriate Assessment

Screening is the process of determining whether an Appropriate Assessment is required for a plan or project. Under Part XAB of the Planning and Development Act, 2000, as amended, screening must be carried out by the Competent Authority. As per Section 177U of the Planning and Development Act, 2000, as amended '*A screening for appropriate assessment shall be carried out by the competent authority to assess, in view of best scientific knowledge, if that Land use plan or proposed development, individually or in combination with another plan or project is likely to have a significant effect on the*

European site'. The Competent Authority's determination as to whether 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.

Consultants or project proponents may provide for the competent authority, the information necessary for them to determine whether an Appropriate Assessment is required and provide advice to assist them in the Article 6(3) Appropriate Assessment Screening decision.

Where it cannot be excluded beyond reasonable scientific doubt at the Screening stage, 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 is required.

Where an Appropriate Assessment is required, the Competent Authority may require the applicant to prepare a Natura Impact Statement.

The term Natura Impact Statement (NIS) is defined in legislation[1]. An 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.

This Article 6(3) Appropriate Assessment Screening Report has been prepared in compliance with the provision of section 177U of the Planning & Development Act 2010 as amended.

1.2.2 Statement of Authority

A field assessment was undertaken in April 2019 by Sarah Mullen (B.Sc., Ph.D.) and Claire Stephens (BSc) of McCarthy Keville O'Sullivan Ltd (MKO) and again in July 2019 by Sarah Mullen. This report has been prepared by Sarah Mullen and Claire Stephens. This report has been reviewed by John Hynes (B.Sc., M.Sc., MCIEEM) who has over 8 years' experience in ecological assessment.

[1] As defined in Section 177T of the Planning and Development Act, 2000 as amended, an NIS means a statement, for the purposes of Article 6 of the Habitats Directive, of the implications of a proposed development, on its own and in combination with other plans and projects, for a European site in view of its conservation objectives. It is required to include a report of a scientific examination of evidence and data, carried out by competent persons to identify and classify any implications for the European site in view of its conservation objectives

2. DESCRIPTION OF THE PROPOSED DEVELOPMENT

2.1 Site Location

The development site is located within the townlands of Roscam, Merlin Park and Murrough in Galway City, immediately south of the Rosshill Road and the railway line (Grid Reference: IG 134208 224980) (Figure 2.1). The proposed development site is 10.0693ha and is surrounded by a number of small residential developments and individual houses.

2.2 Characteristics of the Proposed Development

The application for the proposed works will be made under the Strategic Housing Development (SHD) provisions of the Planning and Development (Housing) and Residential Tenancies Act, 2016. The proposed development will consist of the following:

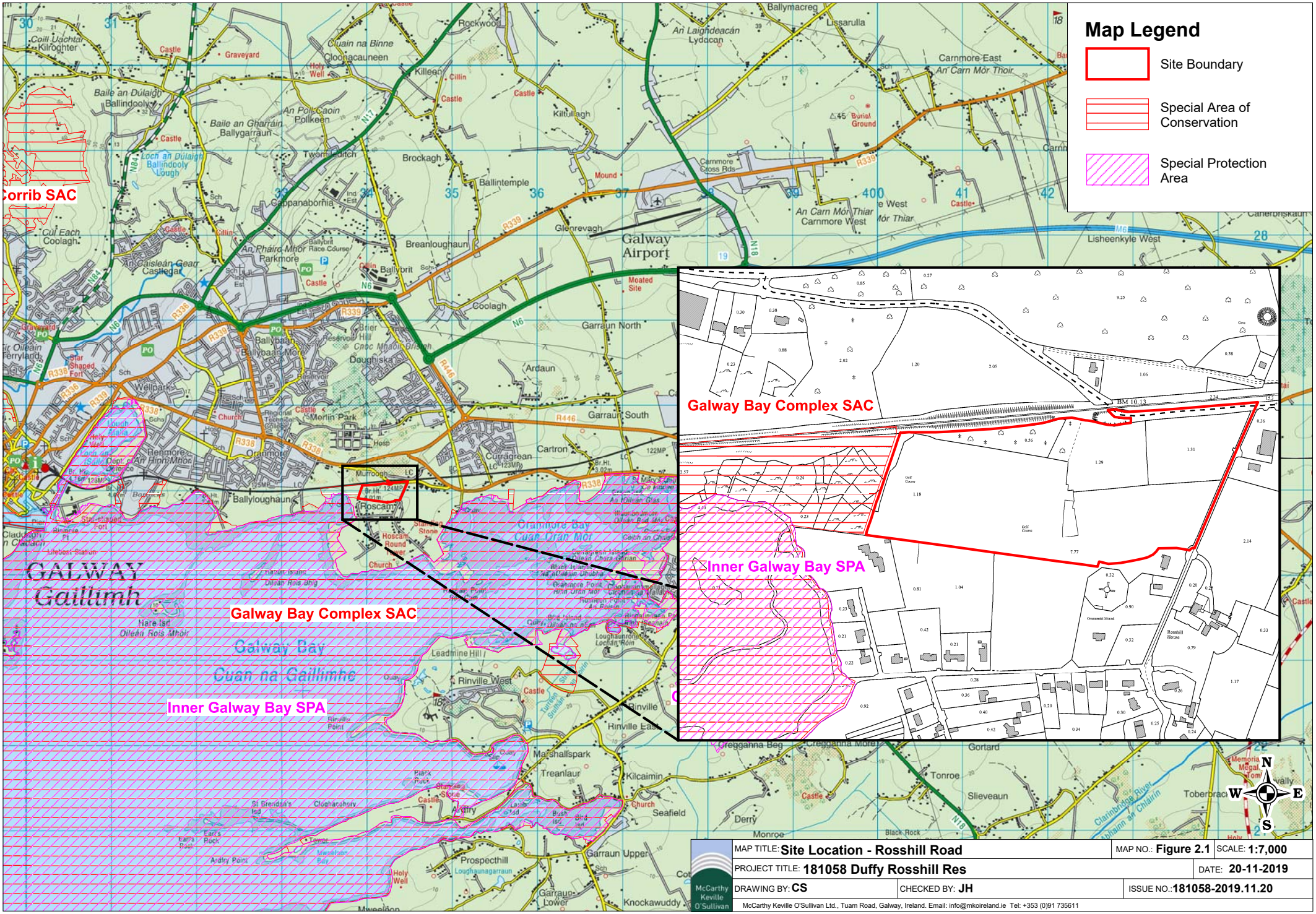
- Construction of 342 no. residential units comprising:
  - 36no. Four Bed Semi-Detached Houses
  - 2 no. Four Bed Detached Houses
  - 68 no. Three Bed Semi-Detached Houses
  - 63 no. Three Bed Terrace
  - 6 no. Two Bed Terrace
  - 5 no. Three Bed Long Semi-Detached Houses
  - 5 no. Four Bed Long Semi-Detached Houses
  - 38 no. One Bed Apartments
  - 119 no. Two Bed Apartments
- A ground-floor community space
- Office, cafe and retail units
- A two-storey childcare facility
- The provision of public realm landscaping including shared public open space and play areas, public art, public lighting, resident and visitor parking including car rental bays, electric vehicle charging points and bike rental spaces
- Pedestrian, cyclist and vehicular links throughout the development.
- Access road and junction improvements at Rosshill Road/Old Dublin Road.
- Provision of all associated surface water and foul drainage services and connections including pumping station. All associated site works and ancillary services.

A site layout is shown in Figure 2.2.

2.3 Description of the Baseline Ecological 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 proposed project proceeding. Ecological baseline conditions are those existing in the absence of proposed activities (CIEEM, 2018).

A multidisciplinary walkover survey was conducted on the 16th of April 2019 in line with NRA (2009) guidelines (*Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes*) by Sarah Mullen (BSc., Ph.D.) and Claire Stephens (B.Sc.) of MKO. The site was revisited on the 9th July 2019 by Sarah Mullen. The survey was undertaken within the optimal time



MAP TITLE: **Site Location - Rosshill Road**		MAP NO.: **Figure 2.1**	SCALE: **1:7,000**
PROJECT TITLE: **181058 Duffy Rosshill Res**			DATE: **20-11-2019**
DRAWING BY: **CS**	CHECKED BY: **JH**	ISSUE NO.: **181058-2019.11.20**	

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MASTER SITE LAYOUT PLAN

NOTE : PLEASE REFER TO ENGINEERS DRAWINGS & REPORTS FOR SERVICE CONNECTION DETAILS

Overall site Mix:

038 no. 1 Bedroom units	11.1%
125 no. 2 Bedroom units	36.5%
136 no. 3 Bedroom units	39.8%
043 no. 4 Bedroom units	12.6%
	100%

Mix by type:

157 Apartments	45.9%
069 Terraces	20.2%
114 Semi-Detached	33.3%
002 Detached	00.6%
	100%

LEGEND

Site boundary outlined in red

OVERALL SITE AREA : **100,693 sqm :- 10.069HA :- 24.881 Acre**
Verges to Old Dublin Road & Rosshill Rd. **: 3,381 sqm :- 0.338 HA**
Junction area **: 628 sqm :- 0.063 HA**
RA zoned Land to west boundary **: 1,292 sqm :- 0.129 HA**
Developable Area : 95,392 sqm :- 9.539 HA :- 23.572 Acre

Galway City Council Development plan 2017-2023:
Site zoned Low Density Residential (LDR)

RESIDENTIAL TOTAL NO. OF UNITS = 342

Density:
35.8 Units per Ha - Residential Density (342 total units on 9.539 ha.)
14.5 Units per Acre - Residential Density (342 total units on 23.572 acre)

Plot ratio **: 0.36 :1** (max allowable 0.46:1)
Site Coverage **: 15.34%**

45.9% Apartments = 157 Units
54.1% Houses = 185 Units

Residential Dwelling Units:

Type 'A-A6'	- 4 bed	Semi -Detached	- Circa 125.4 sqm	TOTAL 36 UNITS
Type 'A2'	- 4 bed	Detached	- Circa 125.4sqm	TOTAL 02 UNITS
Type 'B-B7'	- 3 bed	Semi -D	- Circa 110.4 sqm	TOTAL 24 UNITS
Type 'C-C8'	- 3 bed	Semi -D	- Circa 108.2 sqm	TOTAL 44 UNITS
Type 'C-C10'	- 3 bed	Terrace	- Circa 108.2 sqm	TOTAL 63 UNITS
Type 'D'	- 2 bed	Terrace	- Circa 84.4 sqm	TOTAL 06 UNITS
Type 'E'	- 3 bed	Long semi-D	- Circa 107 sqm	TOTAL 05 UNITS
Type 'F'	- 4 bed	Long semi-D	- Circa 129.8 sqm	TOTAL 05 UNITS

TOTAL UNITS ON SITE = 185 UNITS

Apartment Units:

Type '1A- 1D'	- 1 bed	Apartment	- Circa 49.2sqm (varies) TOTAL 038 UNITS
Type '2A - 2N'	- 2 bed	Apartment	- Circa 78sqm(varies) TOTAL 119 UNITS

TOTAL UNITS ON SITE = 157 UNITS

Public open space requirement over developable area: 15% - 14,309sqm
Public open space provided- Over 21,533sqm - 22.57%
(above 10m wide/ 200sqm & reasonably level usable space)
Overall Green and landscaped space across the site: 25,130sqm - 25.8%

FOR 1:500 SCALE - PART SITE PLAN 1 REFER TO SHEET 3003

FOR 1:500 SCALE - PART SITE PLAN 2 REFER TO SHEET 3004

01 Master Site Layout Plan
Scale: 1:1000

Figure 2.2 Site Layout

MASTER SITE LAYOUT PLAN

CONDITIONS OF USE OF THIS DRAWING: 1. The use of or reliance upon this drawing shall be deemed to be acceptance of these conditions of use unless otherwise agreed in writing, such written agreement to be sought from and issued by the Architects prior to the use or reliance upon this drawing. 2. O'Neill O'Malley Ltd., their agents, Architects, employees or directors shall not be liable for any loss damage or injury consequential or otherwise, howsoever caused for failure to comply with any or all of these conditions. 3. This drawing, the design and contents contained herein are copyright, all rights reserved. No part hereof may be copied or reproduced partially or wholly in any form whatsoever without the prior written consent of the copyright owners O'Neill O'Malley Ltd. 4. The client is granted a copyright licence to use this drawing and its contents for the purpose of which the drawing has been prepared. If this drawing has been produced for construction purposes, the licence will only be valid for a single three dimensional reproduction and shall expire once a single reproduction has occurred. Such a licence only passes to the Client on payment of Architects fees in full and in any event the licence cannot be assigned without the prior written consent of O'Neill O'Malley Ltd. 5. Do not scale off this drawing. Figured metric dimensions only should be taken off this drawing. Imperial dimensions, if any, contained on this drawing are given for illustration purposes only. 6. This drawing is to be relied upon only for the purposes for which it was prepared. This drawing is not to be relied upon for construction purposes and no implied or expressed warranty is given as to the suitability for construction purposes unless the drawing is stated to be for construction purposes. 7. All contractors, whether main or sub-contractors, must visit the site and are responsible for taking and checking any and all dimensions and levels that relate to the works. 8. Where this drawing contains discrepancies in relation to other relevant documents, such discrepancies shall be brought to the attention of the Architects who shall issue a written instruction as to which information is to be followed, and until such Architects instruction has been issued any work carried out on foot of the discrepancies shall be unauthorised. 9. References to National standards, whether to Irish (IS) British (BS) or otherwise, or codes of practice (CP) shall be deemed to refer to the relevant standard or code current at the date of issue of the drawing not withstanding any reference to the contrary or to any earlier standard. 10. Any reference to the "Architect" or "Architects" on this or any other relevant document shall be construed to apply to a director of O'Neill O'Malley Ltd, who has been nominated as the partner-in-charge or to the nominated project Architect but only while such Architect remains in the employment of O'Neill O'Malley Ltd. 11. Any questions as to the meaning or application of these conditions shall be submitted in writing to the Architect for his ruling and such a ruling shall be conclusive as to the meaning or application of these conditions. 12. All information shown relating to existing structure and construction detail is preliminary and subject to 'opening up' and confirmation by the contractor. Any discrepancies are to be referred to the Architect. 13. Proprietary items shall be fixed in strict accordance with manufacturers instructions. 14. Sizes of proprietary items shall be checked with manufacturer and checked for compliance with design detail. 15. Contractor is responsible for procuring any proprietary items required/specified with due attention to 'lead-in' times ensuring compliance with programme dates.

No.	Date	Comments	By

REVISIONS

No.	Date	Comments	By

REVISIONS

Scale: 1:1000
Drawing Purpose: PLANNING
Project: Proposed Development at Rosshill, Galway City
Client: Kegata Ltd.
Date: December 2019
Drawn by: sor
Checked by: JOM
Paper size: CTB file: LTScale:
File path:

File Ref. 3.09 | Subject: MASTER SITE LAYOUT PLAN - FINALISED RED LINE | Project No. 18128 | Drawing No. 3002 | Rev. -

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of year to undertake a habitat and flora survey (Smith *et. al* 2011) and all habitats within and adjacent to the proposed project site were readily identifiable during the site visit.

The majority of the site comprises a network of semi-improved**,** species poor ***Dry neutral grassland (GS1)*** (Plate 2.1). Evidence of grazing by horses was recorded during the site visit in July 2019. Other grassland habitats present included a small area of poorly-drained grassland at the north-west of the site, classified as ***Wet grassland (GS4)*** (Plate 2.2) and a disturbed are in the north-east corner of the site classified as ***Dry calcareous and neutral grassland (GS1)*** (Plate 2.3).

Scattered native and non-native trees are present throughout the site including alder (*Alnus glutinosa*), hawthorn (*Crataegus monogyna*), pine (*Pinus* sp.) and spruce (*Picea* sp.) (Plate 2.4).

Treelines (WL2), comprised predominantly of mature and immature ash (*Fraxinus excelsior*), sycamore (*Acer pseudoplatanus*) and beech (*Fagus sylvatica*) demarcate the boundaries of the development site (Plate 2.5). *Field boundaries within the site are delineated by stone walls classified as* ***Stonewalls and other stonework (BL1), Treelines (WL2)*** and ***Hedgerows (WL1).***

An area of ***Oak-ash-hazel woodland (WD1)*** (Plate 2.6). is present along the northern boundary of the development site towards the west of the site. Species present included ash, sycamore, beech (*Fagus sylvatica*), hawthorn, hazel and occasional holly *(Ilex aquifolium*). An area of ***Scrub (WS1),*** comprised of hawthorn, blackthorn and bramble (*Rubus fruticosus* agg.) with treelines to its north and south is present to the west of the woodland area.

The ruins of an old building are present within the centre of the site. The remaining stone walls of the ruined building are categorised as ***Stonewalls and other stonework (BL1). Scrub (WS1),*** and mature ash (*Fraxinus excelsior*) trees, are present in proximity to this area (Plate 2.7).

None of the habitats within the works areas correspond to those listed on Annex I of the EU Habitats Directive.

Galway Bay Complex SAC is located approximately 5m from the western boundary of the proposed development site. The boundary between the development site and the SAC consists of a mature beech treeline and stone wall. The habitats within the SAC consist of oak-ash-hazel woodland and do not conform to Annex I status.

No watercourses were recorded within or adjacent to the development site. No suitable habitat for otter or seal were identified within the development site and the site does not support suitable wetland habitat for SCI species associated with Inner Galway Bay SPA.

The non-native invasive species, Spanish Bluebell Hybrid (*Hyacinthoides hispanica)* was recorded growing at one location close to the southern boundary of the development site (Plate 2.8). This species is listed on the 'Third Schedule' of Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011).

Plate 2.1 The majority of the site is comprised of semi-improved Dry neutral grassland (GS1).

Plate 2.2 Wet grassland (GS4) to the north-west of the site.

Plate 2.3 Dry calcareous and neutral grassland (GS1) in the north-east corner of the site.

Plate 2.4 Scattered trees towards the south-east of the development site.

Plate 2.5 Mature beech Treeline (WL2) delineating the western boundary of the development site.

Plate 2.6 Oak-ash-hazel woodland (WN2) within the development site close to the northern boundary.

Plate 2.7 Buildings and artificial surfaces (BL3); silage pit constructed within the site of a habitat within stone walls (BL1) remaining from a building in ruin with areas of scrub (WS1) within the development site boundary.

Plate 2.8 The non-native invasive species Spanish Bluebell (Hyacinthoides hispanica) was recorded growing at one location close to the southern boundary of the development site.

2.3.1 Significance of Habitats

No Annex I habitats and no supporting habitat for Annex II species associated with Galway Bay Complex SAC were identified within the proposed development site. No supporting wetland habitat for SCI bird species associated with Inner Galway Bay SPA was identified within the development. None of the habitats within the works areas correspond to habitats listed on Annex I of the EU Habitats Directive.

Habitat mapping undertaken for the N6 Galway City Transport Project (GCTP) was reviewed. The habitats within the development site were not assessed as part of the project (GCTP, 2015).

2.3.2 Fauna

The site is located 5m from Galway Bay Complex SAC which is designated for otter (*Lutra lutra*) and harbour seal (*Phoca vitulina*). The development site does not support suitable habitat for these species. There are no watercourses within or directly adjacent to the proposed development and the shoreline of Galway Bay is buffered from the proposed development by woodland, treelines and agricultural grassland.

Inner Galway Bay is located approximately 95m from the proposed development and is designated for a number of bird species. None of these species were recorded within the development site during the site visits undertaken in April and July 2019. The site consists predominantly of semi-improved grassland and does not support suitable wetland habitat for any of the SCI species for which the SPA is designated. Furthermore the SPA is buffered from the development site by woodland, residential dwellings and agricultural grassland.

2.3.3 Significance of Fauna

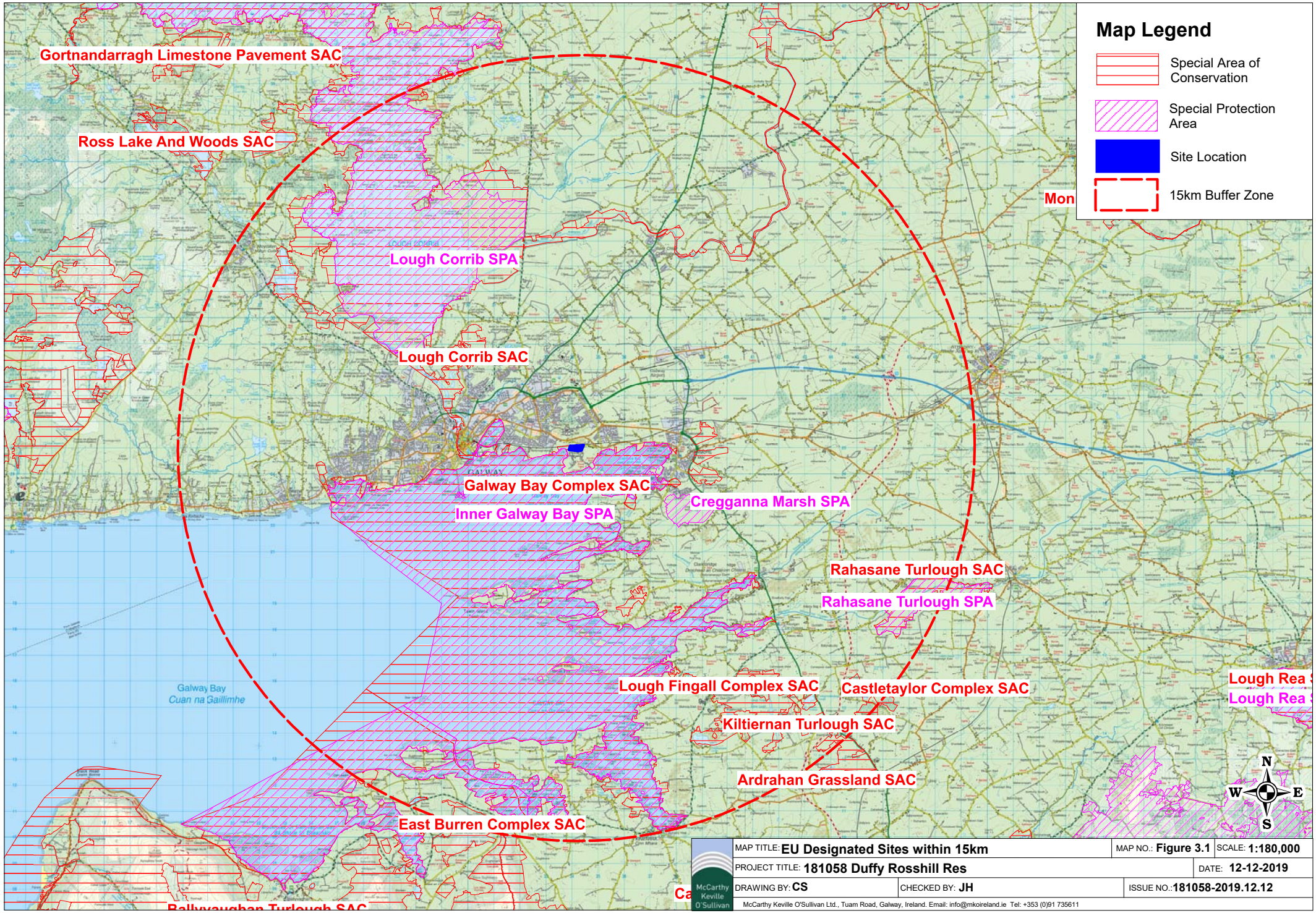
Faunal populations or supporting habitat for faunal species associated with EU sites were not recorded.

3. IDENTIFICATION OF RELEVANT EUROPEAN SITES

3.1 Identification of the European Sites within the Likely Zone of Impact

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 10/12/2019. 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 3.1. 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.
- The catchment mapping was used to establish or discount potential hydrological connectivity between the site of the proposed development and any European Sites.
- 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 10/12/2019. Figure 3.1 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 considered in the Screening Assessment



MAP TITLE: **EU Designated Sites within 15km**		MAP NO.: **Figure 3.1**	SCALE: **1:180,000**
PROJECT TITLE: **181058 Duffy Rosshill Res**			DATE: **12-12-2019**
DRAWING BY: **CS**	CHECKED BY: **JH**	ISSUE NO.: **181058-2019.12.12**	

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Table 3.1 Designated sites within the Likely Zone of Impact

European Sites and distance from proposed development	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 10/12/2019	Conservation Objectives	Likely Zone of Impact Determination
Special Areas of Conservation (SAC)			
Galway Bay Complex SAC [000268] **Distance:** 5m	› 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] › Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] › 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]	Detailed conservation objectives for this site (Version 1, April 2013), were reviewed as part of the assessment and are available at www.npws.ie	There will be no direct effects as the devlopment is located entirely outside of the SAC. There is no potential for indirect effects on the following QIs due to a) the lack of connectivity between the proposed site and populations or habitats for which the site has been designated as mapped in the SSCOs and/or b) the terrestrial/groundwater nature of the QIs: › Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] › 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]

European Sites and distance from proposed development	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 10/12/2019	Conservation Objectives	Likely Zone of Impact Determination
Special Areas of Conservation (SAC)			
	› Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae* [7210] › Alkaline fens [7230] › Limestone pavements [8240] › *Lutra lutra* (Otter) [1355] › *Phoca vitulina* (Harbour Seal) [1365]		› Limestone pavements [8240] › Perennial vegetation of stony banks [1220] › Turloughs [3180] › *Juniperus communis* formations on heaths or calcareous grasslands [5130] Taking a precautionary approach, a potential pathway for indirect effects on the marine/surface water dependent Qualifying Interests was identified in the form of deterioration of water quality resulting from pollution associated with the construction and operational phases of the development. The Qualifying Interests with the potential to be impacted via the identified pathway include: › Mudflats and sandflats not covered by seawater at low tide [1140] › Large shallow inlets and bays [1160] › Reefs [1170] › Coastal lagoons [1150] › *Lutra lutra* (Otter) [1355] › *Phoca vitulina* (Harbour Seal) [1365] › Salicornia and other annuals colonising mud and sand [1310]

European Sites and distance from proposed development	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 10/12/2019	Conservation Objectives	Likely Zone of Impact Determination
Special Areas of Conservation (SAC)			
			› Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] › Mediterranean salt meadows (Juncetalia maritime) [1410] Galway Bay has potential to support otter and harbour seal. Although the development site is buffered from suitable habitat for the species in the SAC the potential for disturbance requires further consideration on a precautionary basis. Consequently, the potential for significant effects on this European Site cannot be excluded at this stage of the Appropriate Assessment process. This site is therefore considered to be **within the Likely Zone of Impact** and further assessment is required.
Lough Corrib SAC [000297] **Distance:** 4.1km	› Oligotrophic waters containing very few minerals of sandy plains *(Littorelletalia uniflorae)* [3110] › Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea*	Detailed conservation objectives for this site (Version 1, April 2017), were reviewed as part of the assessment and are available at www.npws.ie	There will be no direct effects as the proposed development is located entirely outside the designated site. This European site is located in a separate hydrological catchment and there is no

European Sites and distance from proposed development	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 10/12/2019	Conservation Objectives	Likely Zone of Impact Determination
Special Areas of Conservation (SAC)			
	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]		hydrological connectivity between the development site and the SAC. No pathway for indirect effect was identified. Lough Corrib has been selected as a SAC for Lesser Horseshoe Bat because of the presence of one important summer roost. The roost is located to the north of Lough Corrib and more than 30km from the proposed site. The proposed development site is outside of the 2.5km core foraging range for this species as mapped in Map 11 of the detailed Conservation Objectives document. **The site is not within the Likely Zone of Impact and no further assessment is required.**

European Sites and distance from proposed development	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 10/12/2019	Conservation Objectives	Likely Zone of Impact Determination
Special Areas of Conservation (SAC)			
	› 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] ›		
Lough Fingall Complex SAC [000606] **Distance:** 10.4km	› Turloughs [3180] › Alpine and Boreal heaths [4060] › *Juniperus communis* formations on heaths or calcareous grasslands [5130]	This site has the generic conservation objective:	There will be no direct effects as the proposed development is located entirely outside the designated site.

European Sites and distance from proposed development	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 10/12/2019	Conservation Objectives	Likely Zone of Impact Determination
Special Areas of Conservation (SAC)			
	› 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] › Limestone pavements [8240] › *Rhinolophus hipposideros* (Lesser Horseshoe Bat) [1303]	'To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected.' (NPWS Generic version 6.0, 2018)	There is no connectivity between the proposed development and this European Site. There are no watercourses which could act as a conduit for pollution and the SAC is located within a different groundwater body/bodies, i.e. Clarinbridge GWB and GWDTE-Tullynafrankagh Turlough GWB (EPA Envision Webmapper, 2019), to the proposed development. No pathway for indirect effect was identified. The proposed development site lies outside the 2.5km core foraging range for lesser horseshoe bat as outlined in the Conservation Objectives Supporting Document for Lesser Horseshoe Bat (NPWS, 2018). There is therefore no potential for indirect effects on lesser horseshoe bat as a result of the proposed development. **The site is not within the Likely Zone of Impact and no further assessment is required.**

European Sites and distance from proposed development	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 10/12/2019	Conservation Objectives	Likely Zone of Impact Determination
Special Areas of Conservation (SAC)			
Rahasane Turlough SAC [000322] **Distance:** 13.1km	› Turloughs [3180]	This site has the generic conservation objective: 'To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected.' (NPWS Generic version 6.0, 2018)	There will be no direct effects as the proposed development is located entirely outside the designated site. There is no hydrological connectivity between the proposed development site and the SAC and the SAC is located in a different groundwater body, i.e. GWDTE-Rahasane Turlough GWB (EPA Envision Webmapper, 2019), to the development. No pathway for indirect effect was identified. **The site is not within the Likely Zone of Impact and no further assessment is required.**
Kiltiernan Turlough SAC [001285] **Distance:** 13.2km	› Turloughs [3180]	This site has the generic conservation objective: 'To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for	There will be no direct effects as the proposed development is located entirely outside the designated site. There is no hydrological connectivity between the proposed development site and the SAC and the SAC is located in a different

European Sites and distance from proposed development	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 10/12/2019	Conservation Objectives	Likely Zone of Impact Determination
Special Areas of Conservation (SAC)			
		which the SAC has been selected.' (NPWS Generic version 6.0, 2018)	groundwater body/bodies, i.e. GWDTE-Kiltiernan Turlough GWB and Clarinbridge GWB (EPA Envision Webmapper, 2019), to the development. No pathway for indirect effect was identified. **The site is not within the Likely Zone of Impact and no further assessment is required.**
Castletaylor Complex SAC (000242) **Distance:** 13.5km	› 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] › Limestone pavements [8240]	This site has the generic conservation objective: 'To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected.' (NPWS Generic version 6.0, 2018)	There will be no direct effects as the proposed development is located entirely outside the designated site. There is no hydrological connectivity between the proposed development site and the SAC and the SAC is located in a different groundwater body/bodies, i.e. GWDTE-Kiltiernan Turlough GWB and Clarinbridge GWB (EPA Envision Webmapper, 2019), to the development. No pathway for indirect effect was identified.

European Sites and distance from proposed development	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 10/12/2019	Conservation Objectives	Likely Zone of Impact Determination
Special Areas of Conservation (SAC)			
			The site is not within the Likely Zone of Impact and no further assessment is required.
East Burren Complex SAC [001926] **Distance:** 14.2km	› 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]	This site has the generic conservation objective: 'To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected.' (NPWS Generic version 6.0, 2018)	There will be no direct effects as the proposed development is located entirely outside the designated site. This European site is located in a separate hydrological sub-catchment and there is no hydrological connectivity between the development site and the SAC. No pathway for indirect effect was identified. The proposed development site lies outside the 2.5km core foraging range for lesser horseshoe bat as outlined in the Conservation Objectives Supporting Document for Lesser Horseshoe Bat (NPWS, 2018). There is therefore no potential for indirect effects on lesser horseshoe bat as a result of the proposed development. **The site is not within the Likely Zone of Impact and no further assessment is required.**

European Sites and distance from proposed development	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 10/12/2019	Conservation Objectives	Likely Zone of Impact Determination
Special Areas of Conservation (SAC)			
	› 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]		
Ardrahan Grassland SAC (002244) **Distance:** 14.5km	› Alpine and Boreal heaths [4060] › *Juniperus communis* formations on heaths or calcareous grasslands [5130] › Limestone pavements [8240]	This site has the generic conservation objective: 'To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected.' (NPWS Generic version 6.0, 2018)	There will be no direct effects as the proposed development is located entirely outside the designated site. This European site is located in a separate hydrological sub-catchment. The site is designated for terrestrial habitats and there is no hydrological connectivity between the development site and the SAC. No pathway for indirect effect was identified.

European Sites and distance from proposed development	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 10/12/2019	Conservation Objectives	Likely Zone of Impact Determination
Special Areas of Conservation (SAC)			
			The site is not within the Likely Zone of Impact and no further assessment is required.
Special Protection Area (SPA)			
Inner Galway Bay SPA [004031] **Distance:** 94.8m	› 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]	Detailed conservation objectives for this site (Version 1, May 2013), were reviewed as part of the assessment and are available at www.npws.ie	There will be no direct effects as the works are located entirely outside of this European Site. This European Site is located approximately 95m from the development. Although the developments site is buffered from suitable habitat for the SCI species in the SPA the potential for disturbance requires further consideration on a precautionary basis. Taking a precautionary approach, a potential pathway for indirect effects on the marine/surface water dependent SCIs including supporting habitat [A999] was identified in the form of deterioration of water quality resulting from pollution associated with the construction and operational phases of the development.

European Sites and distance from proposed development	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 10/12/2019	Conservation Objectives	Likely Zone of Impact Determination
Special Areas of Conservation (SAC)			
	› 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]		This site is therefore considered to be within the Likely Zone of Impact and further assessment is required.
Cregganna Marsh SPA [004142] **Distance:** 3.7km	› Greenland White-fronted Goose (Anser albifrons flavirostris) [A395]	This site has the generic conservation objective: 'To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA.' (NPWS Generic version 6.0, 2018)	There will be no direct effects as the proposed development is located entirely outside the designated site. This European site is located within the core foraging range for Greenland white-fronted goose as per Scottish Natural Heritage (SNH) guidance 2016), however the site does not provide suitable supporting habitat for this species. There is no connectivity between the development site and the SPA. Given the absence of connectivity and the absence of suitable habitat, no pathway for effect was identified.

European Sites and distance from proposed development	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 10/12/2019	Conservation Objectives	Likely Zone of Impact Determination
Special Areas of Conservation (SAC)			
			The site is not within the Likely Zone of Impact and no further assessment is required.
Lough Corrib SPA [004042] **Distance:** 6.5km	› 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]	This site has the generic conservation objective: 'To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA.' (NPWS Generic version 6.0, 2018) A second objective for this site is included: 'Objective: To maintain or restore the favourable conservation condition of the wetland habitat at Lough Corrib SPA as a resource for the regularly-occurring migratory waterbirds that utilise it.'	There will be no direct effects as the proposed development is located entirely outside the designated site. There is no connectivity between the proposed development and the SPA. The site does not provide suitable supporting habitat for the SCI bird species for which the SPA is designated. Given the absence of connectivity and suitable habitat for SCI species, as well as the distance of this SPA from the works, no pathway for effect was identified. The site is not within the Likely Zone of Impact and no further assessment is required.
Rahasane Turlough SPA (004089)	› Whooper Swan (*Cygnus cygnus*) [A038] › Wigeon (*Anas penelope*) [A050]	'To maintain or restore the favourable conservation condition of the bird species	There will be no direct effects as the proposed development is located entirely outside the designated site.

European Sites and distance from proposed development	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 10/12/2019	Conservation Objectives	Likely Zone of Impact Determination
Special Areas of Conservation (SAC)			
Distance: 13.0km	› Golden Plover (*Pluvialis apricaria*) [A140] › Black-tailed Godwit (*Limosa limosa*) [A156] › Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395] › Wetland and Waterbirds [A999	listed as Special Conservation Interests for this SPA.' (NPWS Generic version 6.0, 2018) A second objective for this site is included: 'To maintain or restore the favourable conservation condition of the wetland habitat at Rahasane Turlough SPA as a resource for the regularly-occurring migratory waterbirds that utilise it.'	There is no hydrological (surface water or groundwater) connectivity between the proposed development and the SPA. The site does not provide suitable supporting habitat for the SCI bird species for which the SPA is designated. Given the absence of connectivity and suitable habitat for SCI species, as well as the distance of this SPA from the works, no pathway for effect was identified. The site is not within the Likely Zone of Impact and no further assessment is required.

4. ARTICLE 6(3) APPROPRIATE ASSESSMENT SCREENING STATEMENT AND CONCLUSIONS

The findings of this Screening Assessment are presented following the European Commission's 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 Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC (EC, 2018) as well as the Department of the Environment's Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities (DoEHLG, 2010).

4.1 Data Collected to Carry Out Assessment

In preparation of the report, the following sources were used to gather information

- Review of NPWS Site Synopses, Conservation Objectives for the European Sites
- Review of 2013 and 2007 EU Habitats Directive (Article 17) Reports.
- Review of online web-mappers: National Parks and Wildlife Service (NPWS), Water Framework Directive (WFD), Geological Survey of Ireland (GSI) & Irish Wetland Bird Survey I-WeBS.
- Review of specially requested records from the NPWS Rare and Protected Species Database for the hectads which overlap with the study area.
- Review of Bird Atlases: (Sharrock, 1976; Lack, 1986; Gibbons et al., 1993; Balmer et al., 2013).
- Review of Birds of Conservation Concern (BoCCI) in Ireland 2014-2019 (Colhoun & Cummins, 2013)
- Review of the Bat Conservation Ireland (BCI) Private Database
- Review of OS maps and aerial photographs of the site of the proposed project.
- Review of relevant databases including National Biodiversity Ireland Database and available literature of previous surveys conducted in the area.
- Review of other plans and projects within the area.
- Site visits conducted by Sarah Mullen (B.Sc., PhD) and Claire Stephens (B.Sc.).

4.2 Concluding Statement

It cannot be concluded beyond reasonable scientific doubt, in view of best scientific knowledge on the basis of objective information and in light of the conservation objectives of the relevant European sites, that the proposed development, individually or in combination with other plans and projects, would not have a significant effect on the Galway Bay Complex SAC and Inner Galway Bay SPA.

As a result, an Appropriate Assessment is required, and a Natura Impact Statement shall be prepared in respect of the proposed development.

5. BIBLIOGRAPHY

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

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APPENDIX 2

CORRESPONDENCE FROM DAU

An Roinn Cultúir,
Oidhreachta agus Gaeltachta
Department of Culture,
Heritage and the Gaeltacht

Your Ref: 181058 Roscam
Our Ref: G Pre0082/2019 *(Please quote in all related correspondence)*

11 April 2019

McCarthy Keville O'Sullivan Ltd.
Planning & Environmental Consultants
MKO,
Tuam Road,
Galway,
H91 VW84

Via email to: smullen@mccarthykos.ie

Re: Notification to the Minister for Culture, Heritage and the Gaeltacht under the Planning and Development Act, 2000, as amended.

Proposed Development: McCarthy Keville O'Sullivan; about to enter the Strategic Housing Development (SHD) process for a residential development in Rosshill, Roscam Galway (location in attached map). The development consists of approximately 300 residential units together with a creche and local services. A site layout drawing is also attached

A chara

On behalf of the Department of Culture, Heritage and the Gaeltacht, I refer to correspondence received in connection with the above.

Outlined below are heritage-related observations/recommendations of the Department under the stated heading(s).

Nature Conservation

The Department refers to your email correspondence of 07/03/19, at pre-application stage, in relation a proposed Strategic Housing Development (SHD) at Rosshill, Roscam, Galway City. The project drawing and proposed layout are noted, as is the indicative ecological scope of works.

This submission is made by the Department in its advisory role in relation to biodiversity, nature conservation, and the nature directives (i.e. the Birds and Habitats Directives). The observations are not exhaustive and focus on key issues of potential relevance to European sites, natural habitats and protected species, biodiversity

protection, aspects of proper planning and sustainable development, and the scope of the environmental assessments that may be required. The observations are made on the basis of the information provided and are without prejudice to any future recommendation that may be made by the Department if/when a planning application is made. The earlier initial email response of 12/03/19 from NPWS to McCarthy Keville O'Sullivan should also be noted.

You are advised to consult the 'Planning' section of the NPWS website[1] as this contains text/advice on consulting NPWS in relation to 'development applications', data and information sources, and the basic elements of environmental assessments that may be required. The observations below are made on the basis that advice on this section of the website has been taken into account.

Project outline and setting

It is understood that the development is to comprise approximately 300 residential units, a crèche and local services. The proposed development site (hereafter the site) is located on the eastern side of the city, south of Merlin Woods and the railway line. The site has an area of approximately 9ha and comprises a network of agricultural grassland fields with some well-developed hedgerows, trees and patches of woodland which merge with larger areas of woodland and wider ecological networks.

The site borders part of the European site, Galway Bay Complex SAC (site code 000268), and is approximately 120m from Inner Galway Bay SPA (site code 004031). The woodland on the site is an extension of woodland in the SAC.

Project description

The NIS, EIAR or ecological impact assessment should be based on full and detailed descriptions of all parts of the project, and all development, including associated and ancillary works and services, and all lands required, at all project stages from construction and operation, to decommissioning, if appropriate. All relevant project details and works areas, whether required on a permanent or temporary basis, should be shown in maps and drawings, and should form part of any application for consent. For a more detailed list of potential considerations, see the 'Review checklist', and specifically 'Section 1 – Description of the project', in Environmental Impact Assessment: Guidance on the preparation of the Environmental Impact Assessment Report (Directive 2011/92/EU as amended by 2014/52/EU) (European Commission, 2017).

NPWS has already advised that no disturbing or damaging ground investigations or testing should take place in advance of the main project consent without due consideration of the need for planning permission (for exempted development where there are restrictions on exemptions). The Council should be consulted, as necessary.

[1] https://www.npws.ie/development%20consultations

Assessments required
You have outlined that an NIS and (non-statutory) ecological impact assessment (EcIA) are being prepared. The information on the scope of the ecological assessments and planned surveys is noted. It is presumed that screening for a sub-threshold EIA will be carried out by An Bord Pleanála when the SHD application is made. Biodiversity impacts of particular relevance to the determination of whether there will be likely significant effects on the environment are set out below.

Likely significant effects on European sites
The site adjoins part of Galway Bay Complex SAC and is close to Inner Galway Bay SPA. Both European sites have site specific conservation objectives, and associated supporting documents and habitat and species datasets, all of which should be accessed and utilised in producing the NIS, if necessary.

In relation to potential significant effects on a European site, assessments are carried out with respect to the implications for the conservation objectives of that site. Where available, the attributes, targets and notes specified as part of the conservation objectives will determine the scope and detail of surveys, data and analyses required to produce an NIS[2], if required. The NIS should present the scientific examination of all necessary evidence and data. It should be noted that the conservation objectives of a European site are wider in scope than the qualifying interests or special conservation interests alone, and will encompass other habitats and species, as well as aspects of habitat structure and function, and existing environmental problems and trends. The final analyses are carried out with respect to whether the conservation objective is to maintain or to restore the favourable conservation condition of the habitat or species in question within the site.

The key concerns in relation to likely significant effects of the project alone and in combination with other plans and projects, on these European sites, in view of their conservation objectives, include the following:

- Disturbance of coastal areas, woodlands and other green areas in and adjacent to European sites arising from the development, from increased local populations, and from increased formal and informal amenity and recreation requirements and provision
- Added pressures on existing water services which, in this case, are linked to European sites, e.g. increased water abstraction from, and increased discharges of treated effluent to SACs and SPAs
- Added pressures on other existing services and infrastructure, including transport infrastructure, and the need for future developments such as roads

[2] Noting the definition and function of 'NIS' in planning law, and the tests and standards of the appropriate assessment process

and cycleways which may be unable to avoid European sites, e.g. as set out in the Galway Transport Strategy

- Increased disturbance and displacement of species, and progressive habitat loss, fragmentation and deterioration within European sites arising the development, increased local populations and urban encroachment, and the pressures outlined above

Likely significant effects on the environment

The site is partly wooded and contains hedgerows and trees. These interlink with Merlin Woods, other wooded areas and hedgerows, the coastal margin and inner bay, and other natural and semi-natural habitats to form an ecological network on the south-eastern edge of Galway city. These areas have a role in relation to the maintenance and restoration of biodiversity, including under Article 10 of the Habitats Directive and as part of the 'green network' of Galway city, and this should be recognised and the layout, design and scale of the development should be planned accordingly. Merlin Woods and other local sites are identified as important biodiversity and natural heritage features in Galway City Development Plan.

The development of the site should be consistent with protective policies and objectives in Galway City Development Plan, including Policy 4.1: Green network, and Policy 4.2: Protected spaces: Sites of European, national and local importance, Policy 4.3: Blue spaces: Coast, canals and waterways, Policy 4.4: Green spaces: Urban woodlands and trees, in particular.

Taking the above, and the results of habitat and species surveys, into account, a constraints-led approach should be adopted in planning and designing the layout and scale of the development, and in devising mitigation measures, including mitigation by avoidance. At a minimum, it is advised that areas of woodland and treelines on and bordering the site should be retained and protected by appropriate setback distances, landscaping and boundary treatments.

Recent habitat mapping is available for the much of Galway city and should be sourced. Substantial data on species, particularly the more mobile species such as bats, are also available for parts of the city and the environmental assessment documentation associated with the proposed N6 Galway City Ring Road should be consulted. Local studies of Merlin Woods have been carried out.

Ecological surveys required

The Department notes the scope of the assessments as set out. Ecological surveys should be carried out in accordance with recognised methodologies, and should provide a comprehensive description and evaluation of the ecological baseline of the site, and an assessment of the likely direct, indirect and cumulative effects of all aspects of the proposed development.

The EIAR or EcIA should contain:

- Full details of habitats and vegetation on and bordering the site, and/or likely to be affected in any way by the development at site preparation, construction and operation stages
- A habitat map
- Mammal surveys, including bat surveys to establish usage of the site and surrounds
- Bird surveys

Proper planning and sustainable development

The planning policy context should include consideration of the extent to which there is compliance with objectives and policies for the protection and conservation of biodiversity and natural heritage in Galway City Development Plan, among other things.

The above observations/recommendations are based on the papers submitted to this Department on a pre-planning basis and are made without prejudice to any observations that the Minister may make in the context of any consultation arising on foot of any development application referred to the Minister, by the planning authority, in her role as statutory consultee under the Planning and Development Act, 2000, as amended.

You are requested to send further communications to this Department's Development Applications Unit (DAU) at manager.dau@chg.gov.ie (team monitored); if this is not possible, correspondence may alternatively be sent to:

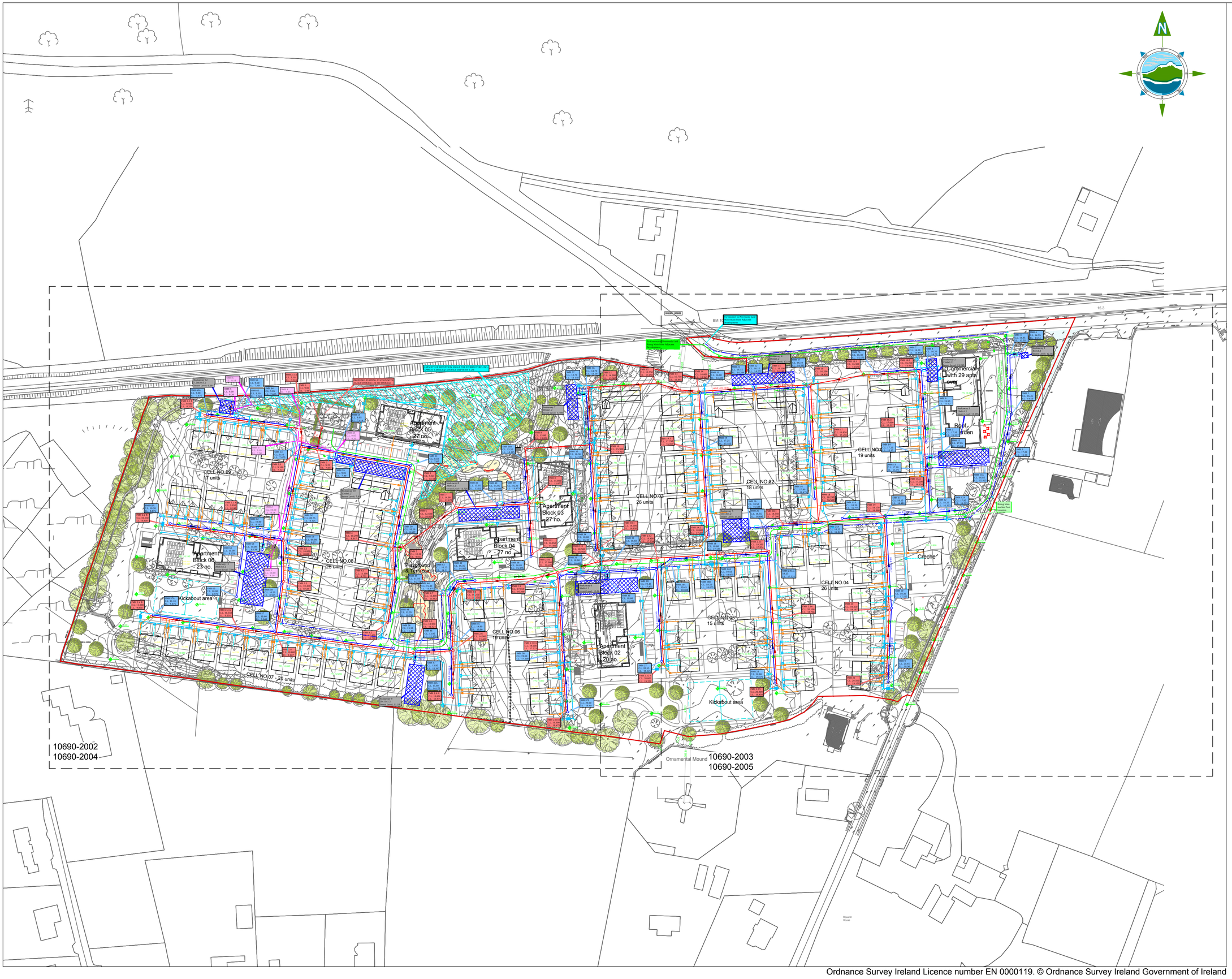
The Manager
Development Applications Unit (DAU)
Department of Culture, Heritage and the Gaeltacht
Newtown Road
Wexford
Y35 AP90

Is mise, le meas

Diarmuid Buttimer
Development Applications Unit

APPENDIX 3

DRAINAGE LAYOUT



LEGEND

- Site Boundary
- Proposed Ø 150mm HDPE Rising Main
- Proposed Foul Sewer and Manhole
- Proposed Inspection Chamber and Connection
- Proposed Storm Sewer and Manhole
- Proposed Soakpit
- Proposed Overflow Network and Manhole
- Proposed Storm overflow Retention Swale
- Proposed Petrol Interceptor
- Proposed Level
- Finished Floor Level
- Proposed Ø 200mm PE100 SDR 17 Water Supply Pipe
- Proposed Ø 150mm PE100 SDR 17 Water Supply Pipe
- Proposed Ø 25/32mm PE80 SDR 17 House Connection and Water Meter
- Proposed Sluice Valve
- Proposed Fire Hydrant
- Proposed Bulk Meter
- Proposed Air Valve
- Proposed Scour Valve Chamber
- Proposed Thrust Block
- Proposed Wash Out Hydrant

NOTES:

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING.
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
3. ENGINEER/EMPLOYERS REPRESENTATIVE, AS APPROPRIATE, TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
4. THE CONTRACTOR SHALL UNDERTAKE A THOROUGH CHECK FOR THE ACTUAL LOCATION OF ALL SERVICES/UTILITIES, ABOVE AND BELOW GROUND, BEFORE ANY WORK COMMENCES
5. ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Rev	Date	Description	By	Chkd.
F	03/12/19	Revised after IW Comments	RD	BH
E	02/12/19	Revised after IW Comments	RD	BH
D	02.12.2019	Minor Revisions to Layout IW Comments Addressed	RD	BH
C	05.11.2019	Revised Architect Layout	JK	RD
B	17.07.19	New Backgorund	FG	RD
A	10.07.19	First Issue	JK	BH

Client: Kegata Ltd

Project: Residential Development at Roshill Galway

Title: Proposed Drainage and Watermain Layout Key Plan

Scale @ A1: 1:1000 A3: 1:2000

Prepared by:	Checked:	Date:
JK	BH	July 2019

Project Director: M. McD.

Drawing Status: Plannning

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Drawing No.: 10690-2001 Revision: F

APPENDIX 4

LETTER FROM IRISH WATER

Barry Duffy

c/o Richard Daly

Tobin Consulting Engineers

1st Floor Fairgreen House

Fairgreen Road

Co. Galway

31 July 2019

Uisce Éireann
Bosca OP 448
Oifig Sheachadta na
Cathrach Theas
Cathair Chorcaí

Irish Water
PO Box 448,
South City
Delivery Office,
Cork City.

www.water.ie

Dear Barry Duffy,

Re: Connection Reference No CDS19001343 pre-connection enquiry -
Subject to contract | Contract denied

Connection for Development of 393 unit(s) at Rosshill, Galway City, Co. Galway.

Irish Water has reviewed your pre-connection enquiry in relation to a water and wastewater connection at Rosshill, Galway City, Co. 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, and subject to the completion of the capital project as referenced below, your proposed connection to the Irish Water network(s) can be facilitated.

Wastewater Connection:

In order to accommodate the proposed connection of the 393 housing units, upgrade works are required to be delivered at Merlin Park No. 1 Pumping Station to provide additional storage. Irish Water is currently delivering a capital project to provide this additional storage. This project is at design stage A connection could be facilitated as soon as practicably possible after the delivery of this project.

It is proposed to connect to the Irish Water network via a pumping station and rising main connection. The proposed pumping station should be sized to cater for development on adjoining lands to the south which are currently zoned low residential. The sizing will be confirmed at connection application stage. The proposed development is high density; therefore the densities of future development on the adjoining lands will require to be determined

Water Connection:

The nearest point of connection to the watermain network will be to a 200mm diameter watermain which is being extended to a point north of the railway bridge on the Coast Road. This watermain extension is currently being delivered as part of the development works for a housing development north of the railway on the Coast Road. A connection can be facilitated to this watermain.

Please be aware that Irish Water is now responsible for the delivery of the connection related works in the public domain. The costs and conditions associated with the connection would be detailed in a connection offer at connection application stage.

Irish Water notes that the scale of this development dictates that it is subject to the Strategic Housing Development planning process. 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.

All infrastructure should be designed and installed in accordance with the Irish Water Codes of Practice and Standard Details. A design proposal for the water and/or wastewater infrastructure should be submitted to Irish Water for assessment. The design proposal can be submitted to cdsdesignqa@water.ie

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 5

LANDSCAPING PLAN

Outdoor gym equipment excercise stationsset at stepped levels among retained existing woodland, connected by non-dig cellweb system permeable gravel surface paths & timber sleeper steps,with FSC hardwood timber seating.

Existing woodland scrub retained and augmented by additional planting of selected native species and selective removal of non natives - managed to enhance visual and ecological value.

Uncut native wildflower meadow grass along woodland scrub margins.

Entrance feature sculpture (to be constructed of locally indigenous materials and based on area identity).

Existing boreen, drystone walls and mature Beech trees retained and protected, using non dig cellweb system permeable gravel surface paths within tree root protection areas.

Existing stone wall retained and repaired (approx height 1.2m).

FOR 1:500 SCALE - PART SITE PLAN 1 REFER TO 19112_3_100 SHEET A

FOR 1:500 SCALE - PART SITE PLAN 1 REFER TO 19112_3_100 SHEET B

Homezone style shared surface

Homezone style shared surface

Homezone style shared surface

Bollards

Bollards

Bollards

Native wildflower meadow grass and seasonal bulb planting.

Outdoor cafe seating area.

Homezone style shared surface

Feature entrance signage.

Raised traffic tables

Feature entrance signage.

Existing stone wall retained & repaired.

Existing roadside trees protected and retained.

Provision for greenway cycle network

Level grass lawn suited to informal ball sports.

Homezone style shared surface.

Mixed mowing regimes in grassland areas (leaving rough wildflower meadow grass along margins).

Non-dig timber sleeper and gravel paths access link to existing boreen avenue facilitating access whilst safeguarding root protection areas.

Feature amphitheatre style seating retains embankment and encloses sand surfaced natural play areas, (equipped with FSC timber adventure play equipment), set into existing slope contours at varying levels and inter-connected by timber sleeper steps and gravel paths). Equipment such a zip lines to take advantage of existing topography slopes and level changes.

Visual linkage to monument retained over level grass lawn suited to informal ball sports.

Existing retained & repaired.

Raised traffic tabl

Apartment Block 01 & Commercial - 29 no. apts

Roof Garden

Creche

Apartment Block 02 - 20 no.

Apartment Block 03 - 27 no.

Apartment Block 04 - 27 no.

Apartment Block 05 - 27 no.

Apartment Block 06 - 27 no.

CELL NO.01 - 19 units

CELL NO.02 - 18 units

CELL NO.03 - 26 units

CELL NO.04 - 26 units

CELL NO.05 - 15 units

CELL NO.06 - 19 units

CELL NO.07 - 20 units

CELL NO.08 - 25 units

CELL NO.09 - 7 units

Playground Area

LEGEND

- Trees Retained
- Proposed Tree (Medium)
- Proposed Tree (Large)
- Proposed Woodland Trees
- Ornamental Street Trees
- Ornamental shrub mix (medium to tall height)
- Ornamental shrub mix (medium to low height)
- Formal clipped hedge
- Wildflower meadow grass (infrequent cut regime)
- Grass Pubic Open Space (frequent cut regime)
- Perennials & Seasonal Bulbs
- Existing scrub vegetation
- Coloured concrete paving setts
- Brushed concrete or tarmac paths
- Cycle racks
- Site Boundary

INDICATIVE PLANTING SCHEDULES / SPECIES LISTS

PARKLAND TREE PLANTING

Species	Specification
(Ag) Alnus glutinosa	12-14cm girth / clearstem / rootball or airpot
(Cd) Cedrus deodara	1-2m high / rootball or airpot
(Cd) Cedrus libanii	1-2m high / rootball or airpot
(Fs) Fagus sylvatica	18-20cm girth / clearstem / rootball or airpot
(Ps) Pinus sylvestris	1m high / rootball or airpot
(Qp) Quercus petraea	18-20cm girth / clearstem / rootball or airpot

STREET TREE PLANTING

Species	Specification
(Bp) Betula pendula	8-10cm girth / clearstem / rootball or airpot
(Pc) Pyrus calleryana 'Chanticleer'	8-10cm girth / clearstem / rootball or airpot
(Sa) Sorbus aria	8-10cm girth / clearstem / rootball or airpot
(Sa) Sorbus aucuparia	8-10cm girth / clearstem / rootball or airpot
(Tc) Tilia cordata 'Greenspire'	8-10cm girth / clearstem / rootball or airpot

NATIVE WOODLAND TREE & UNDERSTORY PLANTING

Species	Specification
(Ag) Alnus glutinosa	10-12cm girth / clearstem / rootball or airpot
(Bp) Betula pubescens	10-12cm girth / clearstem / rootball or airpot
(Ps) Pinus sylvestris	1m high rootball / airpot
(Qp) Quercus petraea	10-12cm girth / clearstem / rootball or airpo
(Ul) Ulmus glabra	6-8cm girth / clearstem /rootballed or airpot
Corylus avellana	1+ 2 br transplant / 60-90cm
Ilex aquifolium	3l pots / 20-30cm

NATIVE HEDGEROW SUPPLEMENTAL PLANTING

Species	Specification
Crataegus monogyna	1+ 2 br transplant / 60-90cm
Euonymous europaeus	1+ 2 br transplant / 60-90cm
Prunus padus	1+ 2 br transplant / 60-90cm
Prunus spinosa	1+ 2 br transplant / 60-90cm
Quercus petraea	6-8cm girth / feathered / bare-root
Sambucus nigra	1+ 2 br transplant / 60-90cm
Rosa canina	1+ 2 br transplant / 60-90cm
Viburnum opulus	1+ 2 br transplant / 60-90cm

CLIPPED HEDGING (6 per lin.m)

Species	Specification
Fagus sylvatica	1+2 bareroot transplants / 60-90cm
Carpinus betulus	1+2 bareroot transplants / 60-90cm

LOW HEIGHT SHRUB MIX - indicative schedule*;

Species	Spec	Density
Cotoneaster decorus	2l pot	3/sqm
Crocosmia lucifer	2l pot	5/sqm
Hypericum hidcote	2l pot	3/sqm
Lavandula angustifolia	2l pot	3/sqm
Prunus laurocerasus 'Zabelliana'	2l pot	2/sqm
Rosa 'Flower Carpet' (White)	2l pot	3/sqm
Stipa tenuissima 'Pony Tails'	2l pot	4/sqm
Viburnum davidii	2l pot	3/sqm

* (An emphasis on pollinator friendly planting to be developed and incorporated to planting schemes at detail design stage, in accordance with 'All Ireland Pollinator Plan').

REV	DATE	AMENDMENT

CUNNANE STRATTON REYNOLDS

LAND PLANNING & DESIGN

GALWAY OFFICE
ARDACONG, BALLYTRASNA, TUAM, CO GALWAY
TEL 093 60854
EMAIL galwayinfo@csrlandplan.ie

N

PROJECT: ROSSHILL, GALWAY.	DATE: DEC 2019
	SCALE: 1:1000 @ A1
DRAWING: LANDSCAPE MASTER PLAN	DRAWN: KM CHECKED: KM
	DRAWING NO: 19112-3-100

APPENDIX 6

FLOOD RISK ASSESSMENT

TOBIN
CONSULTING ENGINEERS
BUILT ON KNOWLEDGE

Kegata Ltd.

Residential Development, Rosshill, Galway

Flood Risk Assessment

Residential Development, Rosshill, Galway
Flood Risk Assessment

Document Control Sheet	
Document Reference	
Report Status	Final Issue
Report Date	10th December 2019
Current Revision	B
Client:	Kegata Ltd.
Client Address:	1st Floor, Fairgreen House, Fairgreen Rd, Galway, H91 AXK8
Project Number	10690

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Revision	Description	Author:	Date	Reviewed By:	Date	Authorised by:	Date
D01	Draft	BM	06/2019	PF	06/2019	PF	06/2019
A	Updated Boundary	BM	12/2019	PC	12/2019	PC	12/2019
B	Minor revisions	BM	12/2019	PC	12/2019	PC	12/2019

TOBIN Consulting Engineers

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1 Introduction

TOBIN Consulting Engineers were appointed in May 2019 to provide engineering and environmental consultancy services for the proposed residential development at Rosshill, in Galway City (Figure 1.1 & Figure 1.2).

This preliminary Flood Risk Assessment (FRA) has been prepared in accordance with a Stage 2 Initial Flood Risk Assessment as defined by the guidelines produced by the Department of Environment, Heritage and Local Government (DoEHLG), *The Planning and Flood Risk Management Guidelines for Planning Authorities, 2009* as follows:

> *"to confirm sources of flooding that may affect a plan area or proposed development site, to appraise the adequacy of existing information and to scope the extent of the risk of flooding which may involve preparing indicative flood zone maps. Where hydraulic models exist the potential impact of a development on flooding elsewhere and of the scope of possible mitigation measures can be assessed. In addition, the requirements of the detailed assessment should be scoped."*

The proposed residential development is located along the Rosshill Road, just off of the Old Dublin Road (see Figure 1.1). The Galway-Dublin railway line passes along the northern boundary of the site. The site is located in a local depression which extends north of the railway line but is divided by the railway line embankment. The greenfield site is approximately 10.06 ha in area. Existing ground elevations vary from 6.70mOD (localised depression) to 20.62mOD.

The aim of this FRA is to "appraise the adequacy of existing information" (extract from PSFRM Guidelines, see above) to identify the risk, if any, of flooding in relation to the proposed development.

Figure 1.1 – Site Location

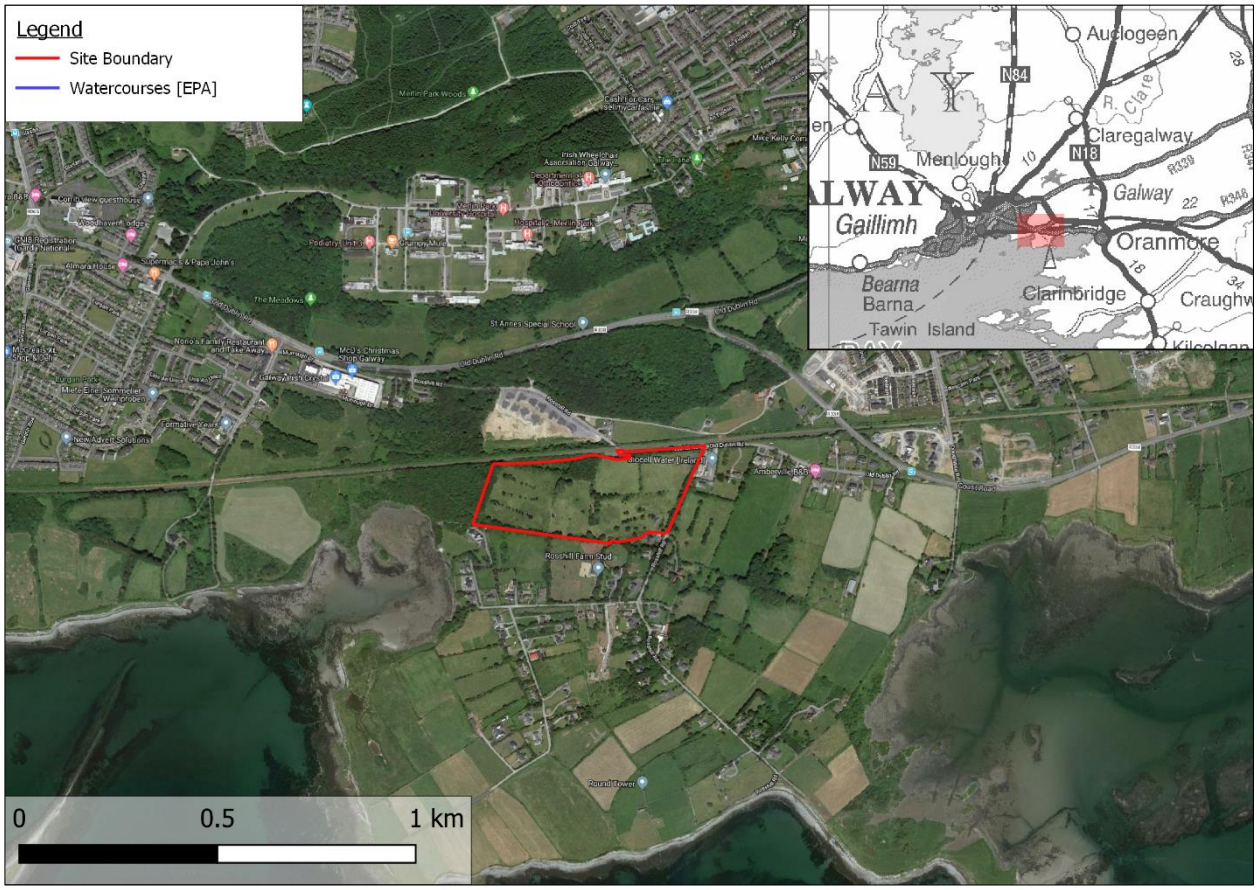


Figure 1.2 - Proposed Site Development Plan

2 Historical Flooding & Flood Maps

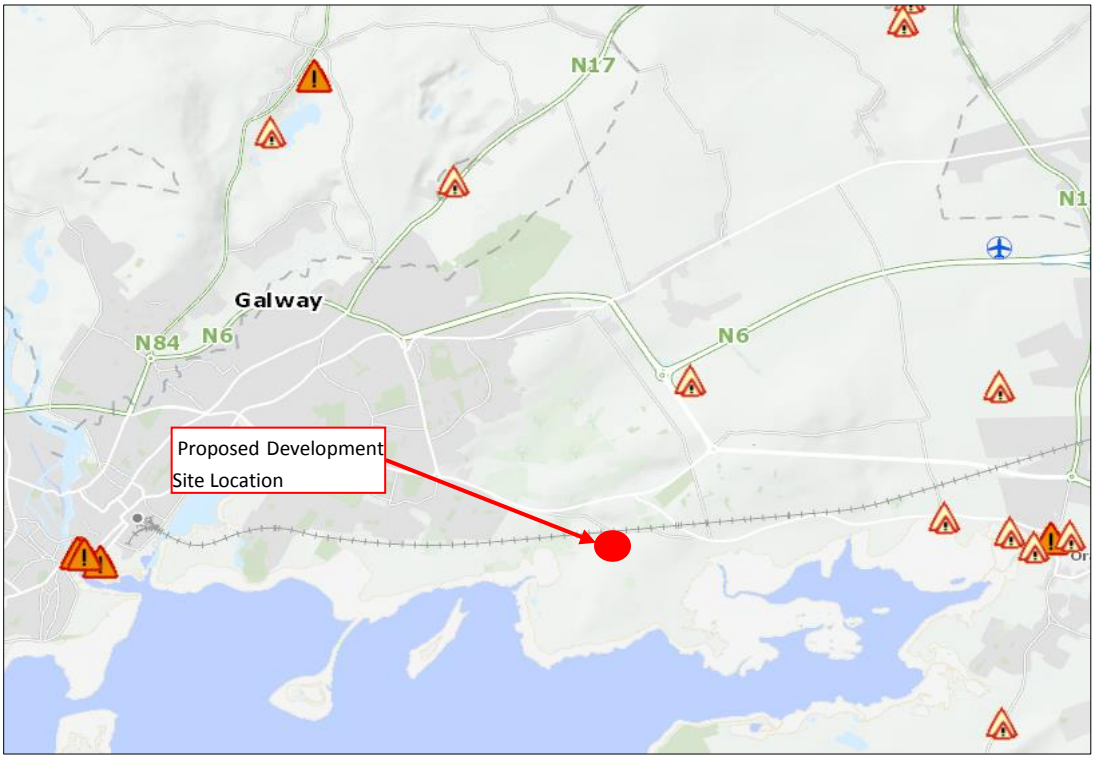
2.1 OPW Flood Maps

Between the years 2004 to 2006 the OPW developed the Flood Hazard Mapping website, www.floodmaps.ie, which provided information about the location of known flood events in Ireland and showed supporting information in the form of reports, photos and press articles about those floods. During this time a huge data collection program was undertaken, visiting over 50 organisations (mainly local authorities and national organisations, eg Waterways Ireland, DoEHLG, and Teagasc) to collect and collate a vast array of information about flooding. The type of information varied from photographs of flood events, to consultants' reports, recordings from gauging stations, eyewitness accounts from staff plus letters from members of the public and minutes of meetings with key officials.

All this information was reviewed, verified, assessed and catalogued to create a National Flood Data Archive. From this the floods were mapped and uploaded to the website. Since 2006, as flood events occurred or as information was submitted to OPW from different sources, including information from the public, new floods and reports were added to the website on an ongoing basis. Past Flood Event information, which has been submitted to and approved by the OPW, is currently accessible for events which occurred pre Autumn 2014. Information on floods that have occurred since then will be uploaded to the website in due course.[1]

The OPW's online National Flood Hazard Mapping database (floodmaps.ie) does not provide any record of flood events occurring at the proposed development site (see Figure 2.1).

Figure 2.1 - Extract from National Flood Hazard Mapping database



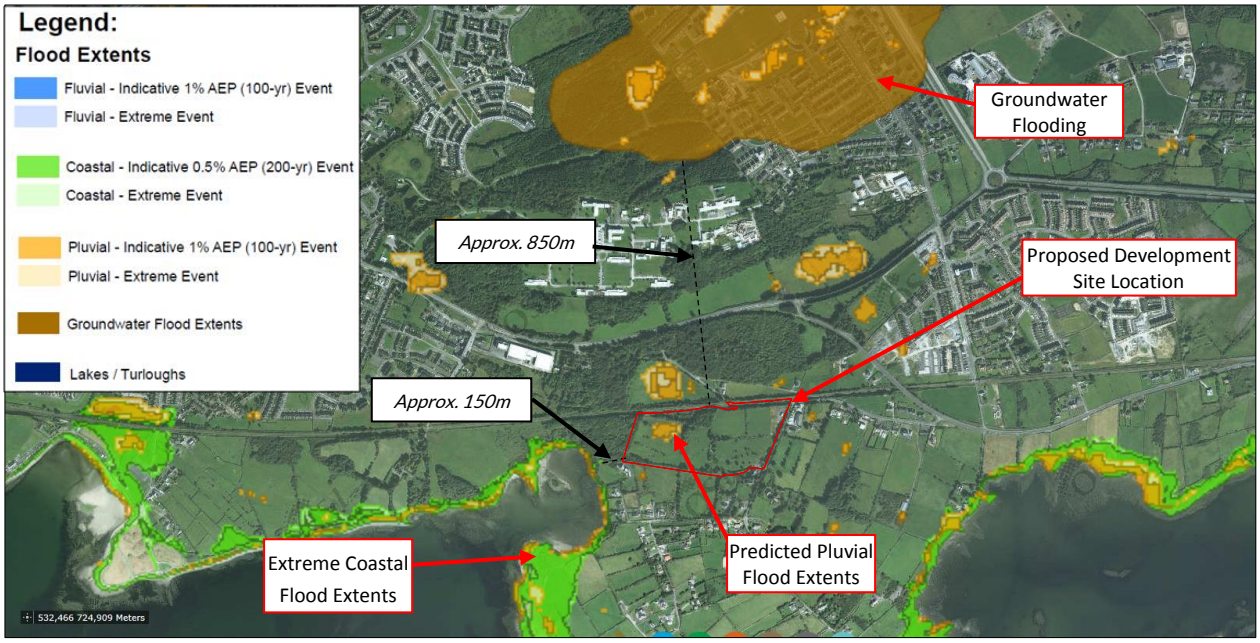
[1] www.floodmaps.ie

2.2 OPW Preliminary Flood Risk Assessment (PFRA) Maps

In 2009 the OPW produced a series of maps to assist in the development of a Preliminary Flood Risk Assessment (PFRA) throughout the country. These maps were produced from a number of sources. It should be noted that *"the flood extents shown on these maps are based on broad-scale simple analysis and may not be accurate for a specific location"*[2].

Figure 2.2 gives an overview of the indicative flood extents in the vicinity of the subject site.

Figure 2.2 - Indicative Flood Mapping from OPW PFRA Study



Fluvial Flood Risk

The predicted flood extents at the subject site are shown in Figure 2.2. It should be noted that these flood extents are for the current probability of flooding and specifically exclude any allowance for climate change.

The PFRA indicative flood mapping of the area does not identify any areas as being liable to fluvial (river) flooding in the vicinity of the proposed site.

Pluvial Flood Risk

Pluvial modelling was carried out by HR Wallingford in November 2010 as part of the PFRA study. The 100- and 1000-year flood extents were generated by analysing 1, 3, 6, and 24-hour rainfall events. The design storm rainfall was applied to the National Digital Terrain Model (DTM) with an allowance for infiltration based on the soil type in the area.

The DTM used for the PFRA study's flood plain mapping was generated from RADAR based technology in 2007 and is stated to have a 5m horizontal resolution (re-sampled to 10m resolution) and 0.01m vertical resolution, to a quoted vertical accuracy of 0.5m RMSE [3]. The accompanying report to the PFRA notes that the process *"due to the scale of analysis, has not taken into account local drainage structures such as culverts through embankments or other local drainage that would not be resolved in the DTM at a national scale".*

---

[2] The National Preliminary Flood Risk Assessment (PFRA) Overview Report, OPW (March 2012)

[3] National Pluvial Screening Project for Ireland (HR Wallingford, November 2012)

The PFRA pluvial flood maps were also adapted by the OPW to show only the extents where the flood depths were greater than 200mm (on the basis that depths lower than this would not cause significant damage given door-step levels above ground level) [4].

The analysis carried out by HR Wallingford as part of their PFRA study indicates that pluvial flooding (ponding of surface water) may occur within the proposed residential development site following an extreme rainfall event (see Figure 2.2).

Groundwater Flood Risk

As part of the PFRA study indicative groundwater flood mapping was produced by Mott Mac Donald Ltd. A model-based approach to generate groundwater flood extents was not possible due to the lack of available data. Therefore, the following methods were used:

1) *"The use of existing mapping of past groundwater flood events (e.g., from 1994/95, and late 2009), developed from ground-based observation, aerial photography or satellite imagery and the maximum extents observed";*
2) *"The delineation of flood extents around turloughs based on an assumed height of flooding of 4m above the base elevation of the turlough (the median of observed ranges) using the OPW's national DTM, with manual adjustment to ensure pragmatic extents";*
3) *"The use of records of past groundwater flood events to validate or adjust the flood extents derived using the other approaches".*

"It should be noted that due to the absence of a model-based approach, only one set of flood extents were generated, with no specific event probability (although where observed flood data was used, these are likely to represent quite extreme events)."[5]

The PFRA mapping did not indicate any sources of groundwater flooding in the vicinity of the proposed residential development site. The indicative flood mapping shows the proposed site is located approximately 850m from the nearest groundwater flood extents (see Figure 2.2).

Coastal Flood Risk

The PFRA study indicates coastal flood extents in Galway Bay. Based on the PFRA flood mapping (Figure 2.2), the proposed development is located approximately 150m outside of the extreme coastal flood event extents. More detailed analysis and mapping of coastal flooding is available from the Irish Coastal Protection Strategy Study and the Western CFRAM Study; refer to section 2.3 and section 2.4 of this report.

[4] The National Preliminary Flood Risk Assessment (PFRA) Overview Report (OPW, March 2012)

[5] The National Preliminary Flood Risk Assessment (PFRA) Overview Report (OPW, March 2012)

2.3 Irish Coastal Protection Strategy Study

RPS Consulting Engineers, in conjunction with the OPW, undertook a project to develop maps indicating coastal and estuarine areas prone to flooding from the sea. The predicted flood extents which were produced under the Irish Coastal Protection Strategy Study (ICPSS)[6] are based on analysis and modelling. The project included:

- *"Numerical Modelling of combined storm surges and tide levels which was used to estimate extreme water levels along the coastline "*
- *"Statistical extreme value analysis and joint probability analysis to both historic recorded tide gauge data and data generated by numerical modelling, which allowed an estimation of the extreme water levels of defined annual exceedance probability (AEP) to be established along the coastline Calculation of the extent of the predictive flooding, by comparing calculated extreme tide and surge waters levels along the coast with ground level based on a Digital Terrain Model (DTM). "*
- *"Definition of the plan extent of the predictive floodplain, by use of a Digital Terrain Model (DTM) commissioned by the Office of Public Works"*

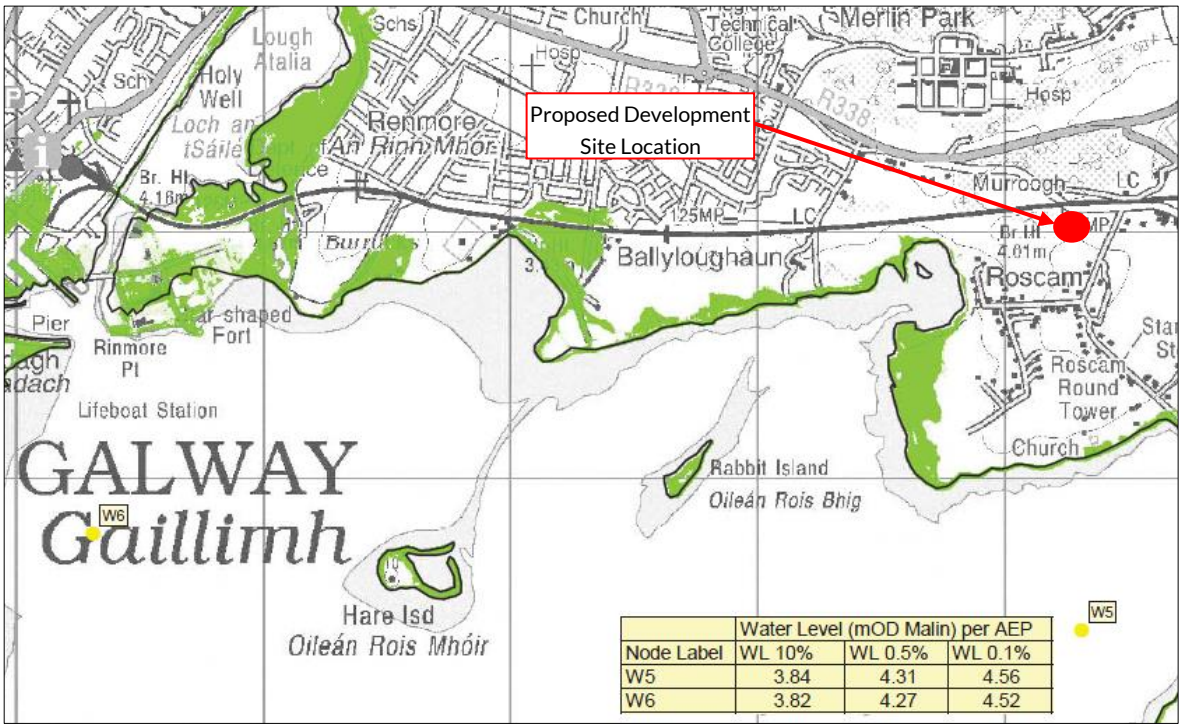
The ICPSS flood mapping was produced by combining the results of the surge and tide level modelling, the statistical analysis, the DTM. The mapping also incorporates future allowances for both mean sea level rise and glacial isostatic adjustment (GIA). The maps have been produced at a strategic level to provide an overview of coastal flood hazard and risk in Ireland, and minor or local features may not have been included in their preparation.[7]

The ICPSS flood mapping for the Mid-Range Future Scenario is shown in Figure 2.3 (see also Appendix A). The proposed development site is located on existing ground with an elevation of between 6.70mOD and 22.62mOD, 1.98 meters above the estimated 1000-year MRFS coastal flood level in Galway Bay of 4.56mOD (Node W5). The mapping indicates that the proposed development site is not likely to be affected by coastal flooding.

[6] Irish Coastal Protection Strategy Study, Work Package 9A - Strategic Assessment of Coastal Flooding Extents – Future Scenario

[7] *"The maps have been produced at a strategic level to provide an overview of coastal flood hazard and risk in Ireland, and minor or local features may not have been included in their preparation. A DTM is used to generate the maps, which is a 'bare earth' model of the ground surface with the digital removal of man-made and natural landscape features such as vegetation, buildings, bridges and embankments. The mapping process can show some of these man-made features, such as bridges and embankments, as flooded on the flood maps, when in reality they do not flood."* [Extract from Irish Coastal Protection Strategy Study, Work Package 9A - Strategic Assessment of Coastal Flooding Extents – Future Scenario]

Figure 2.3 – Irish Coastal Protection Strategy Study Flood Extent Mapping



	Water Level (mOD Malin) per AEP		
Node Label	WL 10%	WL 0.5%	WL 0.1%
W5	3.84	4.31	4.56
W6	3.82	4.27	4.52

2.4 Western CFRAM Study

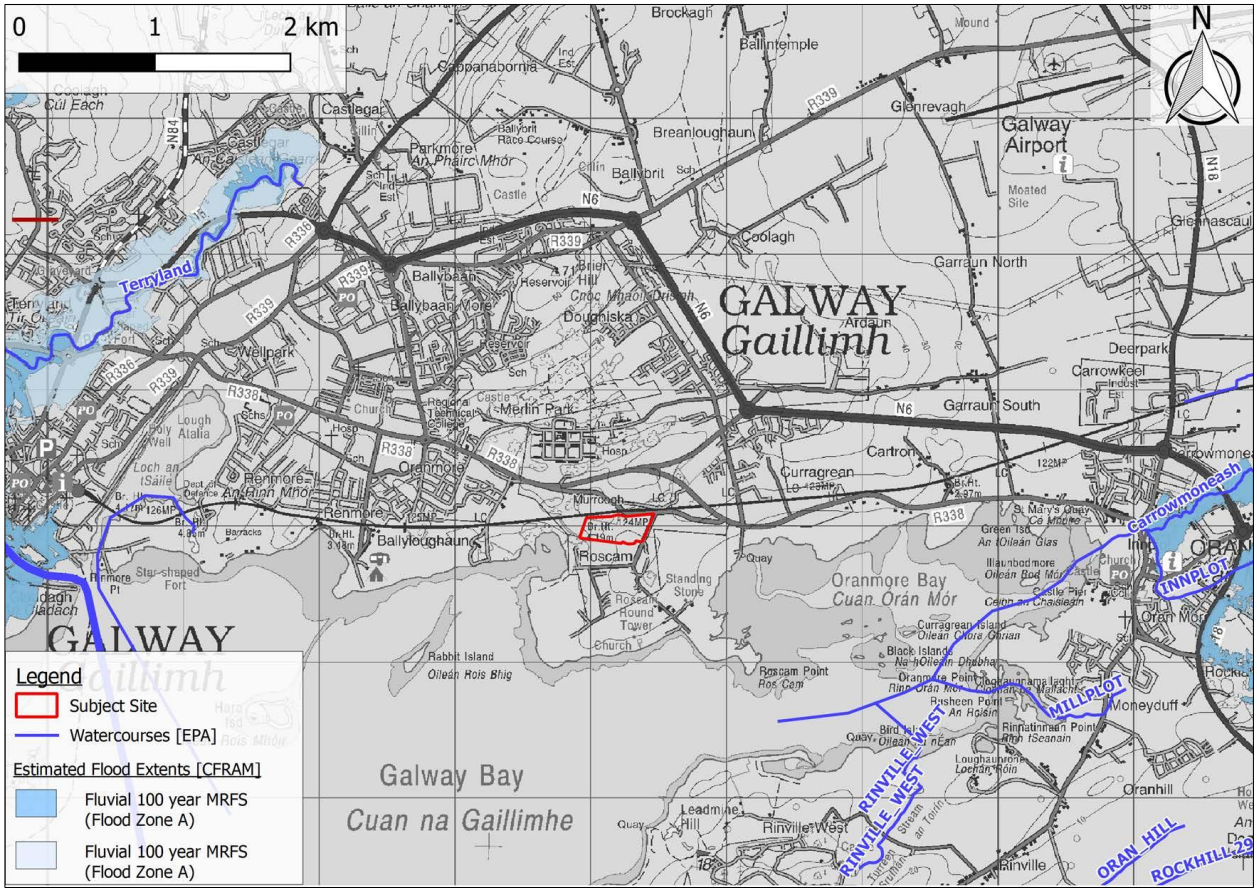
As part of the Western Catchment Flood Risk Assessment and Management (CFRAM) programme, hydraulic modelling of Galway Bay and Galway City's watercourses was carried out by JBA Consulting in 2015. Joint probability analysis was carried out to assess fluvial and coastal flood risk in combination. The final flood extents mapping was published in October 2016.

Western CFRAM - Fluvial flood risk

The predicted fluvial flood extents during the 100- and 1000-year Mid-Range Future Scenarios (MRFS) are shown in Figure 2.4.

The CFRAM Study flood mapping (see Figure 2.4 and Appendix A) does not identify any fluvial (river) flooding in the vicinity of the proposed site.

Figure 2.4 – Predicted Fluvial Flood Extents, Mid Range Future Scenario (Western CFRAM Study)



Western CFRAM - Coastal flood risk

The predicted coastal flood extents during the 200- and 1000-year Mid-Range Future Scenarios (MRFS) are shown in Figure 2.5 (see also Appendix A).

It is our understanding that this mapping was produced using a digital terrain model based on a combination of LiDAR and other ground elevation data. The OSI quote the vertical accuracy of LiDAR data as being +/-25cm.

Based on the results of the CFRAM study (Figure 2.5), the proposed residential development site is unlikely to be affected by flooding during the 1000 year MRFS.

Figure 2.5 - Predicted Coastal Flood Extents, Mid Range Future Scenario (Western CFRAM Study)

3 Planning & Flood Risk Management Guidelines

This section of the report considers the following plans and guidance documents:

- The Planning System and Flood Risk Management Guidelines (OPW & DOEHLG 2009)
- The Flood Risk Management Climate Change Adaptation Plan (OPW 2015)
- The Galway County Development Plan 2017-2023
- The Galway City Development Plan 2011-2017

3.1 The Planning System & Flood Risk Management Guidelines

The *'The Planning System and Flood Risk Management'* (PSFRM) guidance document, published in 2009 by The Department of Environment, Heritage and Local Government (DoEHLG) and the Office of Public Works (OPW), discuss flood risk in terms of three flood zones. It also identifies vulnerability classes for development in order to define what type of development is suitable within what flood zone and when the Justification Test should be applied.

The flood zones, vulnerability classes and requirement for the Justification Test are summarised in Table 1.

Table 1 Matrix of vulnerability versus flood zone to illustrate appropriate development and that are required to meet the Justification Test (Extract from the PSFRM Guidelines)

Flood Zone	Probability of Flooding (Return Period)	Recommendation based on Vulnerability of Development		
		Highly Vulnerable or Essential Infrastructure	Less Vulnerable	Water Compatible
A	High Probability (more frequent than 1% or 1 in 100-yr for river flooding or 0.5% or 1 in 200 for coastal flooding)	Justification Test	Justification Test	Appropriate
B	Moderate Probability (between 0.1% or 1 in 1000 and 1% or 1 in 100 for river flooding and between 0.1% or 1 in 1000 year and 0.5% or 1 in 200 for coastal flooding)	Justification Test	Appropriate	Appropriate
C	Low Probability (less frequent than 1 in 1000-yr)	Appropriate	Appropriate	Appropriate

The PSFRM Guidelines state that 'dwelling houses', such as the proposed development subject of this flood risk assessment, are classified as "highly vulnerable" development in terms of their sensitivity to flooding. The proposed development has been assessed using the 1000-yr flood event.

3.2 The Flood Risk Management Climate Change Adaption Plan

The Flood Risk Management Climate Change Adaptation Plan (published May 2015) has been prepared under the remit of the National Climate Change Adaptation Framework. It sets out the policy on climate change adaptation of the Office of Public Works (OPW), the lead agency for flood risk management in Ireland, based on a current understanding of the potential consequences of climate change for flooding and flood risk in Ireland, and the adaptation actions to be implemented by the OPW and other responsible Departments and agencies in the flood risk management sector.

The document recommends two future flood risk scenarios for considering future implications of factors, including climate change, in relation to future flooding. The Mid-Range Future Scenario (MRFS) recommends a "likely" future scenario while the High-End Future Scenario (HEFS) represents a more "extreme" future scenario. Table 2 sets out the allowances for both scenarios.

Table 2 Allowances in Flood Parameters for the Mid-Range and High-End Future Scenarios

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

Note 1: Applicable to the southern part of the country only (Dublin – Galway and south of this)

Note 2: Reduction in the time to peak (Tp) to allow for potential accelerated runoff that may arise as a result of drainage of afforested land

Note 3: Add 10% to the Standard Percentage Runoff (SPR) rate: This allows for temporary increased runoff rates that may arise following felling of forestry.

For the purpose of this flood risk assessment, we have assessed the proposed development against the Mid-Range Future Scenario as it represents a likely future scenario.

3.3 Galway County Development Plan (2015-2021)

Chapter 8 of the 2015-2021 County Development Plan (CDP) deals with the area of flood risk.

The following are the key policies described in the CDP pertaining to flood risk:

Policy FL 1 *"It is the policy of Galway County Council to support, in co-operation with the OPW, the implementation of the EU Flood Risk Directive (2007/60/EC), the Flood Risk Regulations (SI No. 122 of 2010) and the DEHLG/OPW publication The Planning System and Flood Risk Management Guidelines (2009) (and any updated/superseding legislation or policy guidance). Galway County Council will also take account of the Shannon International and Western Catchment Flood Risk Assessment and Management Studies."*

Policy FL 4 *"The Council shall implement the key principles of flood risk management set out in the Flood Risk Management Guidelines as follows:*

(a) Avoid development that will be at risk of flooding or that will increase the flooding risk elsewhere, where possible;

(b) Substitute less vulnerable uses, where avoidance is not possible; and

(c) Mitigate and manage the risk, where avoidance and substitution are not possible.

Development should only be permitted in areas at risk of flooding when there are no alternative, reasonable sites available in areas at lower risk that also meet the objectives of proper planning and sustainable development.

Development in areas which have the highest flood risk should be avoided and/or only considered in exceptional circumstances (through a prescribed Justification Test) if adequate land or sites are not available in areas which have lower flood risk."

A Stage 1 Strategic Flood Risk Assessment (SFRA) was carried out as part of the 2015-2021 Galway County Development Plan. The SFRA notes that the Western CFRAM study identified Galway City as one of the areas for further study. The findings of the CFRAM study are detailed in Section 2.4 of this Flood Risk Assessment report.

3.4 Galway City Development Plan

Sections 9.3 of the 2017-2023 Galway City Development Plan deal with the assessment of flood risk.

The key policies in the City Development Plan relevant flood risk assessment are given below:

Support, in co-operation with the OPW, the implementation of EU Flood Risk Directive (2007/60/EC), the Flood Risk Regulations (SI no. 122 of 2010), the DECLG and OPW Guidelines for Planning Authorities, the Planning System and Flood Risk Management (2009), updated/superseding legislation or departmental guidelines and have regard to the findings and relevant identified actions of the future Corrib Catchment Flood Risk Assessment and Management (CFRAM) Study, as the study progresses and incorporate these into the Development Plan, where appropriate.

Have regard to the recommendations of the Strategic Flood Risk Assessment (SFRA) for the Galway City Development Plan 2017-2023 in the assessment of development in identified areas of flood risk (See Figure 3.1).

Restrict the location of structures other than structures with essential links to the waterway and public utilities within 10 metres of the River Corrib in G agricultural zoned lands.

Protect and promote sustainable management and uses of water bodies and watercourses from inappropriate development, including rivers, streams, associated undeveloped riparian strips, wetlands and natural floodplains.

Ensure flood risk is addressed in any future local area plans, framework plans and masterplans in the city and have regard to the findings of the Strategic Flood Risk Assessment for Three Local Area Plans 2012 in the preparation of LAPs for Ardaun, Headford Road area, and Murrough.

Require a site-specific Flood Risk Assessment (FRA) for planning applications in identified areas at risk of flooding, where appropriate, in accordance with the recommendations of the Strategic Flood Risk Assessment (SFRA) for the Galway City Development Plan 2017-2023.

Facilitate sustainable flood defence and coastal protection works in order to prevent flooding and coastal erosion, subject to environmental, visual and built heritage considerations.

Ensure any proposal aimed at alleviating flooding will be subject to Appropriate Assessment in accordance with Article 6 of the EU Habitats Directive, where appropriate.

Ensure the use of SUDS, sustainable urban drainage systems, wherever practical, in the design of development to reduce the rate and quantity of surface water run-off.

Ensure new development, where appropriate, is designed and constructed to meet the flood design standards outlined under Section 11.27 Flood Risk Management and the recommendations of the Strategic Flood Risk Assessment (SFRA) for the Galway City Development Plan 2017-2023.

Have regard to the findings of the OPW's Irish Coastal Protection Strategy Study (2013) of the west coast.

Continue to protect the coastal area and foreshore and avoid inappropriate development in areas at risk of coastal erosion and/or would cause and escalate coastal erosion in adjoining areas.

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

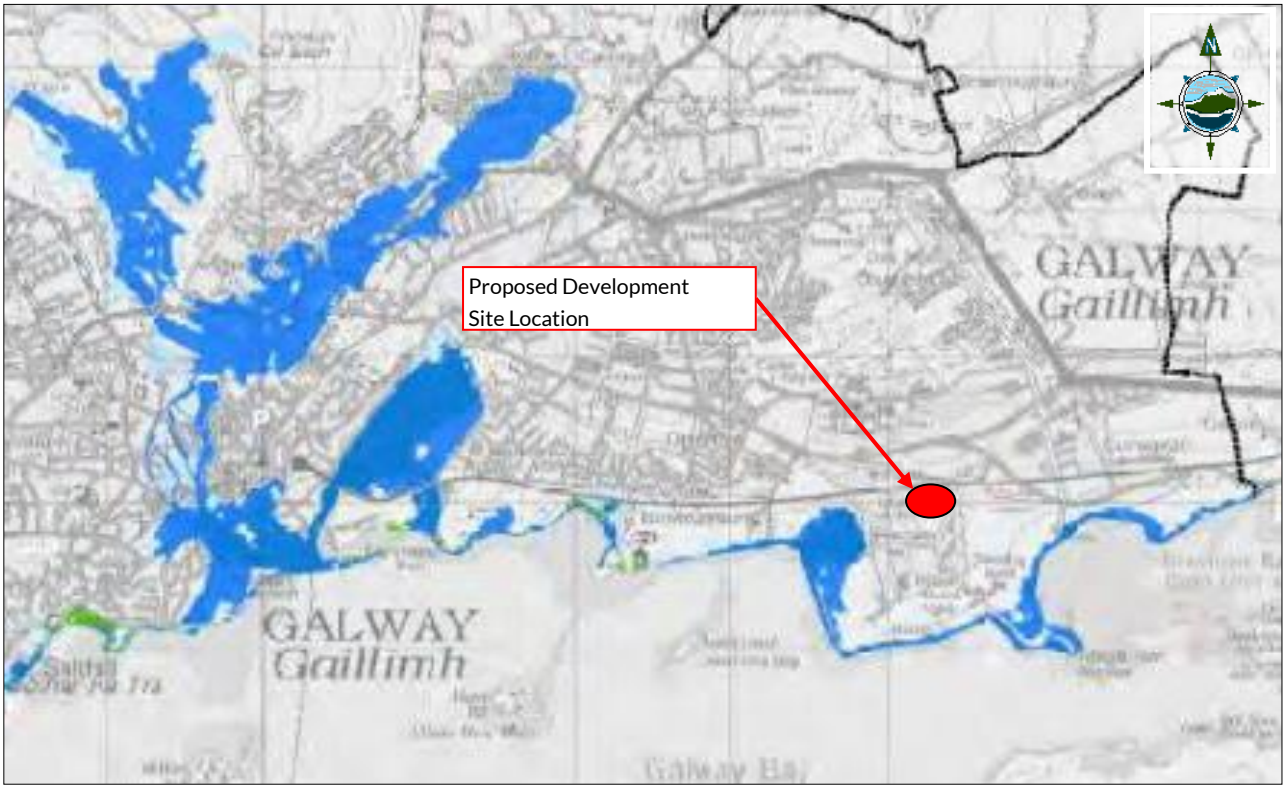
The design standards outlined under Section 11.27 Flood Risk Management in the Galway City Development Plan (as referenced above) are as follows:

- *Where development is proposed in identified flood risk areas under Western CFRAM, the type or nature of the development needs to be carefully considered and the potential risks mitigated and managed through on-site location, layout and design of the development to reduce flood risk to an acceptable level.*
- *Development shall have regard to the flood resilient design guidance and flood mitigation measures in the City Council's Strategic Flood Risk Assessment for Galway City Development Plan 2017-2023*
- *In identified flood risk areas, Flood Zone A or B, it will be necessary to carry out a Site-Specific Flood Risk Assessment (FRA), appropriate to the scale and nature of the development and the risks arising. Proposals shall demonstrate appropriate mitigation and management measures in the layout and design of development.*
- *All proposed development must consider the impact of surface water flood risk in drainage design. Consideration should be given in the design of new development to the incorporation of SUDS. The drainage design should ensure no increase flood risk to the site or downstream catchment.*

- *Development proposals in identified flood risk areas shall consider and incorporate the potential impacts of climate change and residual risk into development layout and design.*
- *In areas of identified flood risk all developments including minor works and changes of use should include an appropriate level of FRA. This assessment must demonstrate that the development would not increase flood risk in the context of use, emergency access and infrastructure. Development should demonstrate principles of flood resilient design.*

A Strategic Flood Risk Assessment (SFRA)[8] was completed by JBA in 2015 to accompany the City Development Plan. The SFRA largely summarises the recommendations of the OPW's Planning System and Flood Risk Management guidance document. The SFRA Flood Zone mapping (Figure 3.1) was taken from the Western CFRAM Study, which has been reviewed in Section 2.4 of the report.

Figure 3.1 - Galway City SFRA "Flood Zone Mapping"



[8] Galway City Development Plan, Strategic Flood Risk Assessment, JBA Consulting (December 2015)

4 Flood Risk Assessment

Referring to Section 3.1 of this report, the proposed residential development is classified as "highly vulnerable" in terms of its sensitivity flooding. The PSFRM guidance document recommends that such developments be constructed in flood zones C, i.e. that there is less than a 0.1% probability of the site flooding. Accordingly, the proposed development has been assessed against a 1,000-year flood event (i.e. 0.1% Annual Exceedance Probability).

4.1 Fluvial Flood Risk

There are no rivers or streams evident in the vicinity of the site.

The Western CFRAM Study indicative flood mapping of the area does not show the subject site as being liable to fluvial (river) flooding.

4.2 Groundwater Flood Risk

Based on a review of the PFRA study and GSI mapping of karst features in the area (Figure 4.1), there is no evidence to suggest groundwater flooding at the proposed development site.

Figure 4.1 - Karst features in vicnity of proposed site [GSI database]

4.3 Pluvial Flood Risk

Pluvial modelling carried out by HR Wallingford as part of the PFRA study indicated that the proposed site may be liable to pluvial flooding, see Figure 2.2. Potential mitigation measures to minimize the risk of pluvial flood flooding are outlined in Section 4.7.

4.4 Coastal Flood Risk

Based on the coastal flood mapping produced by the Irish Coastal Protection Strategy Study (see Figure 2.3) and the Western CFRAM Study (see Figure 2.5) the estimated risk of coastal flooding to the site is minimal.

The ICPSS flood mapping for Mid-Range Future Scenario is shown in Figure 2.3. The proposed development site is located on existing ground with an elevation of between 6.70mOD and 22.62mOD. The finished floor levels of the proposed development are between 9.30mOD and 20.65mOD.

The predicted 1000-year MRFS coastal flood level in Galway Bay is 4.56mOD (Figure 2.3), 4.74 meters below the finished floor level of the proposed residential development.

Due to the proximity of the site to Galway Bay, coastal flooding was examined as a potential risk to the proposed development. Modelling of coastal flood risk along the west coast has been carried out as part of the following studies:

- Irish Coastal Protection Strategy Study (ICPSS) (see Section 2.3)
- Western Catchment Flood Risk Assessment and Management (CFRAM) Study (see Section 2.4)

<u>Irish Coastal Protection Strategy Study (ICPSS)</u>

As part of the *Irish Coastal Protection Strategy Study* (ICPSS) in 2012, RPS carried out hydraulic modelling of tidal and storm surge flooding along the west coast of Ireland, including Galway Bay. For a mid-range future scenario (MRFS), the study predicted 200 year and 1000 year water levels of 4.31mOD and 4.56mOD respectively. This includes a 500mm allowance for rise in sea level due to climate change. The ICPSS flood extents map indicates that the 1,000 year MRFS flood remains approximately 150m from site (see Figure 2.3).

The proposed development site is located on existing ground with an elevation of between 6.70mOD and 22.62mOD, which are at least 2.14mOD above the 1,000-year MRFS flood level of 4.56mOD predicted by the ICPSS. The finished floor levels of the proposed development are between 9.30mOD and 20.65mOD.

The ICPSS model calibration report also states that "the overall tolerance for the south west, west, north west and Shannon Estuary extreme water levels is considered to be ±180mm".

<u>Western Catchment Flood Risk Assessment and Management (CFRAM) Study</u>

JBA Consulting developed coastal models of the floodplain beyond the coastline as part of the modelling phase of the Western CFRAM Study.

A 2D cell size of 4m was used to represent the coastal domain. The active model area was determined using the LIDAR data for the Area for Further Analysis (AFA). Areas of high ground were deemed 'natural boundaries' and serve well as model extents.[9]

Figure 2.5 shows the flood extents predicted by the Western CFRAM Study at the proposed residential development site. The coastal flood extents shown by the CFRAM mapping adjacent to the proposed site location is comparable with that shown by the ICPSS mapping (see Figure 2.3). The CFRAM study predicts that coastal flooding will not extend to the proposed site during the 1,000 year event.

[9] Western CFRAM UoM 30 – Corrib Hydraulic Modelling Report: Volume 2c – Galway City

Coastal Flood Level

The flood level based on the 1,000-year flood event, as recommended for residential developments (i.e. "Highly Vulnerable Developments"), is summarised in Table 3. An estimate of the 200 year flood level is also provided.

Table 3 Estimated Design Coastal Flood Level

Description	200-year flood	1,000-year flood
Flood Level[1]	3.81mOD	4.06mOD
Allowance for 95% Confidence[1]	0.18m	0.18m
Allowance for MRFS Mean Sea Level Rise[2]	0.5m	0.5m
Estimated Flood Level	**4.49mOD**	**4.74mOD**
Allowance for MRFS Land Movement[2]	0.03m	0.03m
Freeboard[3]	0.30m	0.30m
Estimated Flood Level + Freeboard	**4.82mOD**	**5.07 mOD**

Note 1: Design flood level, and allowance for 95% confidence, is taken from Irish Coastal Protection Strategy Study (ICPSS) (see Section 2.3).

Note 2: Allowance for mean sea level rise and land movement taken from the Flood Risk Management Climate Change Adaptation Plan (May 2015) (see Section 3.2). Allowance for land movement was taken as 0.5mm per year for 60 years.

Note 3: Freeboard taken from the Multi-Coloured Manual (2010) produced by the Flood Hazard Research Centre (FHRC), Appendices to Chapter 4: Flood damage to residential properties and related social impacts. The manual indicates damage is incurred for residential properties for flood levels at and above 0.3m below ground floor level.

The minimum existing ground levels on the Rosshill site are 6.54mOD, i.e. 1.47m above the proposed 1,000-year MRFS coastal flood level of 5.07mOD (see Table 3). It is proposed that road levels within the Rosshill site will be raised to at least 7.20mOD, and finished floor levels will be raised to at least 9.30mOD.

Based on the proposed levels at the site, the development is not predicted to flood during a 1 in 1,000 year MRFS coastal flood event.

It should be noted that the above levels relate to coastal flooding only. Other flood sources (i.e. pluvial and groundwater) are discussed in the relevant sections of this report.

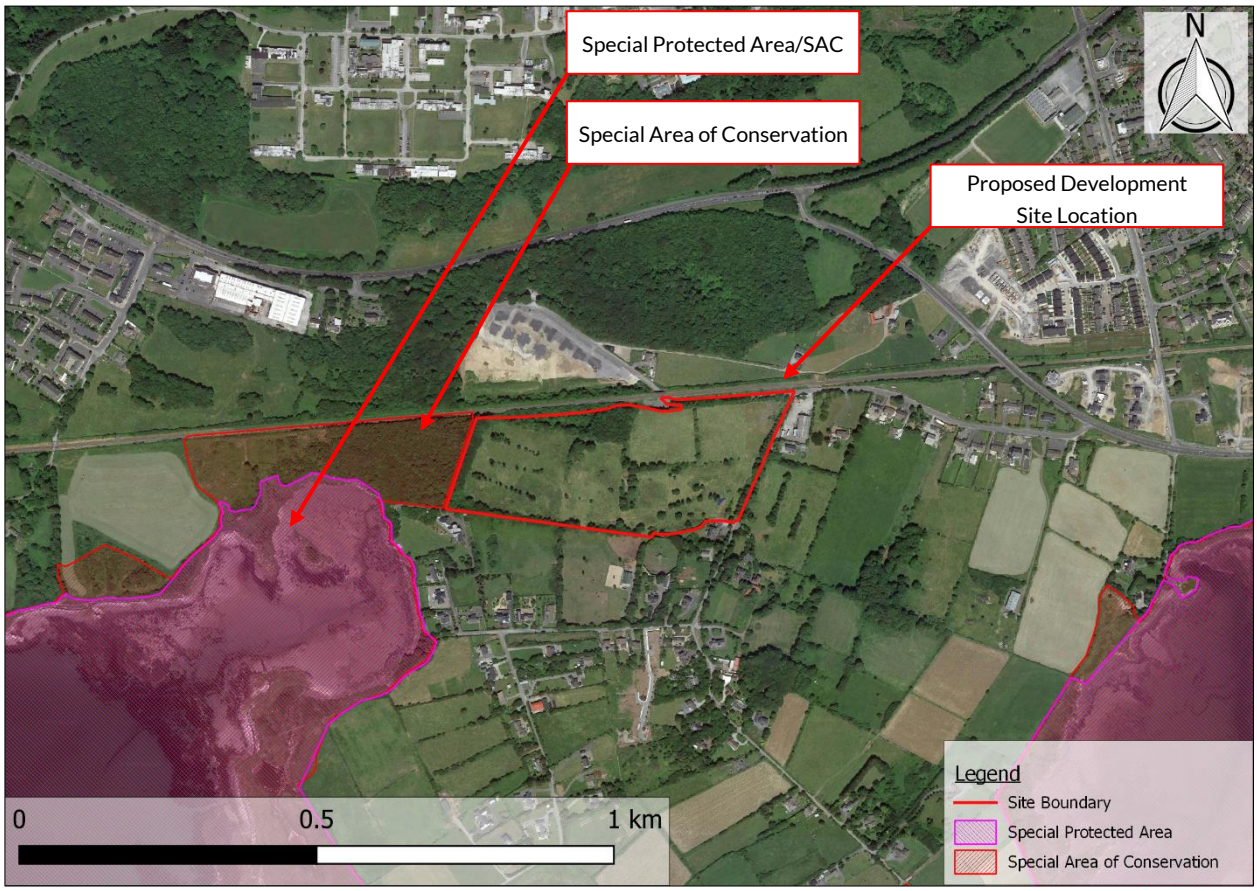
4.5 Impact of the Development Elsewhere

The proposed residential development is located along the Rosshill Road, just off the Old Dublin Road (Figure 4.2). The Galway-Dublin railway line passes along the northern boundary of the site and a Special Area of Conservation is located on the western side of the site (Figure 4.2).

It is predicted that the proposed development is not at risk from fluvial flooding during the 1000-year mid-range future scenario. Therefore, the development will not affect floodplain storage or obstruct the flow path of any existing watercourses.

Surface water arising onsite will be managed by a dedicated storm water drainage system designed by TOBIN Consulting Engineers. The site drainage will include measures in accordance with the requirements of SUDS to limit runoff from the development to greenfield runoff rates. On this basis, it is predicted that the proposed development will not contribute towards flood risk elsewhere in the area.

Figure 4.2 - SAC/SPA Mapping (Extract from National Parks and Wildlife Services)



4.6 The Justification Test

The Planning System and Flood Risk Management Guidelines set out guidance for the application of the Justification Test to assess the appropriateness of developments being proposed in areas of flood risk.

Based on the results of this flood risk assessment, it is predicted that the proposed development site may be liable pluvial flooding (ponding of surface water) following an extreme rainfall event (see Figure 2.2).

Box 5.1 in Section 5.15 of the Planning and Flood Risk Management Guidelines for Planning Authorities, 2009 states that *"When considering proposals for development, which may be vulnerable to flooding, and that would generally be inappropriate as set out in Table 3.2, the following criteria must be satisfied:"*

1. *The subject lands have been zoned or otherwise designated for the particular use or form of development in an operative development plan, which has been adopted or varied taking account of these Guidelines*
2. *The proposal has been subject to an appropriate flood risk assessment that demonstrates:*

I. *The development proposed will not increase flood risk elsewhere and, if practicable, will reduce overall flood risk;*
II. *The development proposal includes measures to minimise flood risk to people, property, the economy and the environment as far as reasonably possible;*
III. *The development proposed includes measures to ensure that residual risks to the area and/or development can be managed to an acceptable level as regards the adequacy of existing flood protection measures or the design, implementation and funding of any future flood risk management measures and provisions for emergency services access; and*
IV. *The development proposed addresses the above in a manner that is also compatible with the achievement of wider planning objectives in relation to development of good urban design and vibrant and active streetscapes.*

3. *The acceptability or otherwise of levels of residual risk should be made with consideration of the type and foreseen use of the development and the local development context.*

Justification Test

1. The subject lands have been zoned or otherwise designated for the particular use as per the Galway City Development Plan 2017-2023
2. Referring specifically to the flood risk issues, this flood risk assessment demonstrates that:
   I. The development proposed will not increase flood risk elsewhere (see Section 4.5).
   II. The development proposal includes measures to minimise flood risk to people, property, the economy and the environment as described in Section 4.7.
   III. The development proposed includes measures to ensure that residual risks to the area and/or development can be managed to an acceptable level (see Section 4.7).

4.7 Flood Risk Mitigation Measures

Pluvial flooding has been identified as the primary cause for potential flooding at the proposed development site location. As per Section 6.9.1 of the Strategic Flood Risk Assessment developed as part of the Galway City Development Plan 2017-2023; *"To address flood risk in the design of new development a risk based approach should be adopted to locate more vulnerable land use i.e. residential housing to higher ground while water compatible development i.e. car parking, recreational space can be located in higher flood risk areas."*

Appendix A (Drawing no. 3 and drawing no. 4) of this report shows the topography of the proposed development site. Existing levels show a low point within the development site which corresponds with the area indicated as potentially liable to pluvial flooding on the PFRA Flood Mapping, Figure 2.2.

Mitigation measures

- Site drainage and storm water storage will be provided to cater for surface water runoff for a design return period 100-year storm event. The storm networks on the western section have been designed to a 1 in 1000 year flood event.
- Surface water runoff from the site will be limited to greenfield runoff rates by the proposed surface water management system in accordance with the SUDS design principals.
- The landscaping and topography of the developed site shall provide safe exceedance flow paths in the event of extreme flood events or in the case of a blockage of the drainage system, to minimise risks to people and property.
- In an extreme weather event, overflow from the attenuation tank will exit via a high-level overflow to a detention basin located at the north west corner of the proposed development site. During extreme rainfall events, any surface water runoff which exceeds the underground site drainage capacity shall be permitted to flow through a defined flow path to the detention.

5 Conclusion

TOBIN Consulting Engineers were appointed in May 2019 to provide engineering and environmental consultancy services for the proposed residential development at Rosshill, in Galway City (Figure 1.1 & Figure 1.2).

The Flood Risk Assessment (FRA) undertook a review of:

- OPW Flood Hazard mapping
- OPW Preliminary Flood Risk Assessment (PFRA) Study
- The Planning System & Flood Risk Management (PSFRM) Guidelines
- Flood Risk Management Climate Change Adaptation Plan
- Galway County Development Plan (2015-2021);
- Galway City Development Plan (2017-2023);
- Western CFRAM Study;
- Irish Coastal Protection Strategy Study;

With reference to the PSFRM guidelines, the proposed residential development is classified as a "highly vulnerable development" in terms of its sensitivity to flooding. Such developments are considered appropriate within Flood Zone C, i.e. in areas not liable to flooding during a 1-in-1000 year Mid-Range Future Scenario.

The outcome of the Flood Risk Assessment is summarised as follows:

Fluvial Flooding

Based on the results of the PFRA (Figure 1.1) and Western CFRAM study (Figure 2.4) it is predicted that the subject site is not liable to fluvial (river) flooding during a 1000 year MRFS.

It is therefore estimated that the risk of fluvial flooding to the development is minimal.

Groundwater Flooding

Based on a review of the PFRA study and GSI mapping of karst features in the area, there is no evidence to suggest groundwater flooding at the site. It is estimated that the risk of groundwater flooding to the proposed development is minimal.

Pluvial Flooding

Pluvial modelling carried out by HR Wallingford as part of the PFRA study indicated that the proposed site may be liable to pluvial flooding, see Figure 2.2. Potential mitigation measures to minimize the risk of pluvial flood flooding are as follows.

- Site drainage and storm water storage will be provided to cater for surface water runoff for a design return period 100-year storm event. The storm networks on the western section have been designed to a 1 in 1000-year flood event.
- Surface water runoff from the site will be limited to greenfield runoff rates by the proposed surface water management system in accordance with the SUDS design principals.
- The landscaping and topography of the developed site shall provide safe exceedance flow paths in the event of extreme flood events or in the case of a blockage of the drainage system, to minimise risks to people and property.
- In an extreme weather event, overflow from the attenuation tank will exit via a high-level overflow to a detention basin located at the north west corner of the proposed development site. During extreme rainfall events, any surface water runoff which exceeds the underground site drainage capacity shall be permitted to flow through a defined flow path to the detention.

Coastal Flooding

The minimum existing ground levels on the Rosshill site are 6.70mOD, i.e. 1.63m above the estimated 1,000-year MRFS coastal flood level of 5.07mOD (Table 3). It is proposed that road levels within the Rosshill site will be raised to at least 7.2mOD, and finished floor levels will be raised to at least 9.30mOD.

Based on the proposed levels at the site, the development is not predicted to flood during a 1 in 1,000 year MRFS coastal flood event.

It is estimated that the risk of flooding the proposed residential development will be minimal, and it is predicted that the development will not increase the risk of flooding elsewhere.

Appendix 1 - Drawings

Irish Coastal Protection Strategy Study Flood Extent Mapping

Predicted Coastal Flood Extents, Mid Range Future Scenario (Western CFRAM Study)

Part 1 Site Layout Plan

Part 2 Site Layout Plan

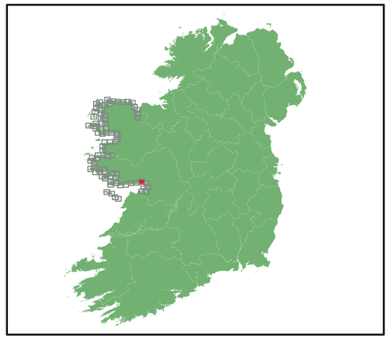
N

GALWAY
Gaillimh

	Water Level (mOD Malin) per AEP		
Node Label	WL 10%	WL 0.5%	WL 0.1%
W5	3.84	4.31	4.56
W6	3.82	4.27	4.52

0.5 0.25 0 0.5 1 1.5 2 Kilometers

Location Plan :



EXTENT MAP

Legend:

- 0.5% AEP FLOOD EXTENT (1 in 200 chance in any given year)
- 0.1% AEP FLOOD EXTENT (1 in 1000 chance in any given year)
- High Water Mark (HWM)
- Node Point
- W 15 — Node Label (refer to table)

USER NOTE :

USERS OF THESE MAPS SHOULD REFER TO THE DETAILED DESCRIPTION OF THEIR DERIVATION, LIMITATIONS IN ACCURACY AND GUIDANCE AND CONDITIONS OF USE PROVIDED AT THE FRONT OF THIS BOUND VOLUME. IF THIS MAP DOES NOT FORM PART OF A BOUND VOLUME, IT SHOULD NOT BE USED FOR ANY PURPOSE.

RPS
Elmwood House
74 Boucher Road
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BT 12 6RZ
Northern Ireland

OPW
Office of Public Works
17-19 Lower Hatch Street
Dublin 2
Ireland

Project :
IRISH COASTAL PROTECTION STRATEGY STUDY - PHASE IV

Map :
WEST COAST FLOOD EXTENT MAP

Map Type :	FLOOD EXTENT		
Source :	TIDAL FLOODING		
Map area :	RURAL AREA		
Scenario :	MID RANGE FUTURE SCENARIO		
Figure By :	PJW	Date :	Dec 2012
Checked By :	JMC & JR	Date :	Dec 2012

Figure No. : W / RA / EXT / MRFS / 10

Revision 1

Drawing Scale : 1:25,000 Plot Scale : 1:1 @ A3

133500 134000 134500

225000 224500 224000

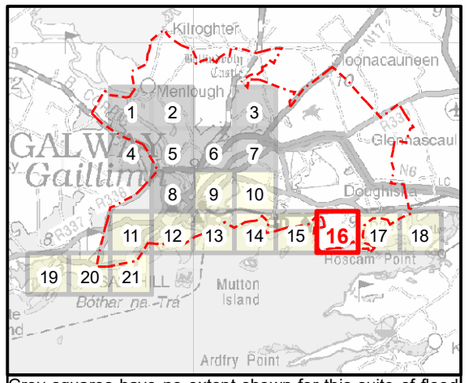
Sand

Sand and Shingle

Sand and Shingle

Pond

0 50 100 200 300 400 500 Metres



Grey squares have no extent shown for this suite of flood maps so no maps have been produced.

AFA Boundary

Modelled River Centreline

10% AEP Tidal Extent

0.5% AEP Tidal Extent

0.1% AEP Tidal Extent

IMPORTANT USER NOTE:
THE VIEWER OF THIS MAP SHOULD REFER TO THE DISCLAIMER, GUIDANCE NOTES AND CONDITIONS OF USE THAT ACCOMPANY THIS MAP.

OPW
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The Office of Public Works

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Jonathan Swift Street
Trim
Co. Meath

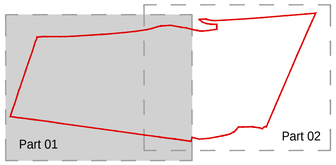
JBA consulting

JBA Consulting
24 Grove Island
Corbally
Limerick, Ireland

WESTERN CFRAM STUDY
CATCHMENT FLOOD RISK ASSESSMENT AND MANAGEMENT

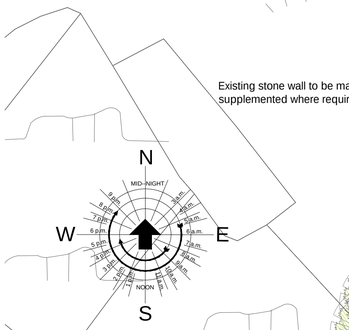
Map: Galway City Flood Extent			Final
Map Type: Flood Extent			
Map Area: HPW		Source: Coastal	Scenario: Current
Drawn by: KF	Date: Apr 2017	Scale:	
Checked by: TS	Date: Apr 2017	1:5,000	
Approved by: JC	Date: Apr 2017	Original @ A3	
Map No: W30GLW_EXCCD_F1		**Sheet:**	16 of 21

PART 01- SITE LAYOUT PLAN



02 Location key
Scale: n.t.s

NOTE : PLEASE REFER TO ENGINEERS DRAWINGS & REPORTS FOR SERVICE CONNECTION DETAILS



Existing stone wall to be made good & supplemented where required

Hedgerow to obscure pumping station backed with 2.4m 'Ibex' type fencing to IW requirements

Existing stone wall to be made good & supplemented where required

Underground Pumping station location to engineers specification & design

existing stone wall to be maintained

1.1m high Relocated stone wall constructed with displaced wall stone

Covered Bicycle store

Bin store 06

Public open space Area 10: 1468 sqm

Apartment Block 05 - 27 no.

Shared surface area: 479sqm

Shared surface area: 210sqm

Public open space Area 09: 6626 sqm

Bin store 04 & Covered Bicycle store

Apartment Block 03 27 no.

CELL NO.09 17 units

CELL NO.03 26 units

Apartment Block 06 - 27 no.

Public open space Area 12: 939 sqm

Kickabout area

Public open space Area 11: 560 sqm

Public open space Area 12: 3714 sqm

CELL NO.08 25 units

Playground & Terraces steps

Apartment Block 04 - 27 no.

Public open space Area 06: 447 sqm

Public open space Area 05: 832 sqm

CELL NO.07 - 20 units

CELL NO.06 19 units

Apartment Block 02 20 no.

Covered Bicycle store

Bin store 03

Public open space Area 07: 3975 sqm

Provision for Greenway cycle network as per Galway development plan 2017-2023

Possible future link to adjacent lands zoned LDR

Possible future link to adjacent lands zoned LDR

Rosshill Folly (Protected structure RMP no. GA094 -070 , RPS 8803)

Ornamental Mou

LEGEND

Site boundary outlined in red

OVERALL SITE AREA : **100,693 sqm :- 10.069HA :- 24.881 Acre**
Verges to Old Dublin Road & Rosshill Rd. **: 3,381 sqm :- 0.338 HA**
Junction area **: 628 sqm :- 0.063 HA**
RA zoned Land to west boundary **: 1,292 sqm :- 0.129 HA**
Developable Area : 95,392 sqm :- 9.539 HA :- 23.572 Acre

Galway City Council Development plan 2017-2023:
Site zoned Low Density Residential (LDR)

RESIDENTIAL TOTAL NO. OF UNITS = 342

Density:
35.8 Units per Ha - Residential Density (342 total units on 9.539 ha.)
14.5 Units per Acre - Residential Density (342 total units on 23.572 acre)

Plot ratio **: 0.36 :1** (max allowable 0.46:1)
Site Coverage **: 15.34%**

45.9% Apartments = 157 Units
54.1% Houses = 185 Units

Residential Dwelling Units:

Type 'A-A6'	- 4 bed	Semi -Detached	- Circa 125.4 sqm	TOTAL 36 UNITS
Type 'A2'	- 4 bed	Detached	- Circa 125.4sqm	TOTAL 02 UNITS
Type 'B-B7'	- 3 bed	Semi -D	- Circa 110.4 sqm	TOTAL 24 UNITS
Type 'C-C8'	- 3 bed	Semi -D	- Circa 108.2 sqm	TOTAL 44 UNITS
Type 'C-C10'	- 3 bed	Terrace	- Circa 108.2 sqm	TOTAL 63 UNITS
Type 'D'	- 2 bed	Terrace	- Circa 84.4 sqm	TOTAL 06 UNITS
Type 'E'	- 3 bed	Long semi-D	- Circa 107 sqm	TOTAL 05 UNITS
Type 'F'	- 4 bed	Long semi-D	- Circa 129.8 sqm	TOTAL 05 UNITS

TOTAL UNITS ON SITE = 185 UNITS

Apartment Units:

Type '1A- 1D'	- 1 bed	Apartment	- Circa 49.2sqm (varies) TOTAL 038 UNITS
Type '2A - 2N'-	2 bed	Apartment	- Circa 78sqm(varies) TOTAL 119 UNITS

TOTAL UNITS ON SITE = 157 UNITS

Public open space requirement over developable area: 15% - 14,309sqm
Public open space provided- Over 21,533sqm - 22.57%
(above 10m wide/ 200sqm & reasonably level usable space)
Overall Green and landscaped space across the site: 25,130sqm - 25.8%

Overall site Mix:

038 no. 1 Bedroom units	11.1%
125 no. 2 Bedroom units	36.5%
136 no. 3 Bedroom units	39.8%
043 no. 4 Bedroom units	12.6%
	100%

Mix by type:

157 Apartments	45.9%
069 Terraces	20.2%
114 Semi-Detached	33.3%
002 Detached	00.6%
	100%

01 PART 01 Site Layout Plan
Scale: 1:500

No.	Date	Comments	By

REVISIONS

No.	Date	Comments	By

REVISIONS

PART 01- SITE LAYOUT PLAN

Scale: 1:500	Drawing Purpose: PLANNING	File Ref. 3.09	Subject: PART 01 - SITE LAYOUT PLAN - FINALISED RED LINE	Project No. 18128	Drawing No. 3003	Rev. -

Project: Proposed Development at Rosshill, Galway City
Client: Kegata Ltd.
Date: December 2019 Drawn by: sor Checked by: JOM
Paper size: CTB file: LTScale:
File path:

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PART 02- SITE LAYOUT PLAN

Rosshill Railway Bridge (Protected structure RPS 8806, NIAH 30409423)

BM 10.13

SITE NOTICE LOCATION

EXISTING ENTRANCE to be closed to traffic and area fininshed in accordance with GCC requirements (shown hatched in Cyan.

Bollards

Bin store 01

Covered Bicycle store

Location of public art

Apartment Block 01 & Commercial -29 no. apts

FFL 16.650 Unit no.s 64-92

Roof Garden

Cafe Terrace

Public open space Area 08: 670 sqm

Shared surface area: 441sqm

Shared surface area: 2105sqm

Shared surface/ homezone area: 7460sqm

Public open space Area 10: 1468 sqm

Public open space Area 09: 6626 sqm

Bin store 04 & Covered Bicycle store

Apartment Block 03 27 no.

Unit no.s 200-226

FFL 17.000

Apartment Block 04 - 27 no.

Unit no.s 173-199

FFL 16.900

Public open space Area 06: 447 sqm

CELL NO.03 26 units

CELL NO.02 18 units

CELL NO.01 19 units

Public open space Area 04: 640 sqm

Public open space Area 01: 355 sqm

Entrance signifier

Possible Galway Bike share location (10 no.)

Public open space Area 02: 454 sqm

Creche

FFL 18.900

CELL NO.06 19 units

CELL NO.05 15 units

CELL NO.04 26 units

Apartment Block 02 - 20 no.

Unit no.s 134-153

Public open space Area 05: 832 sqm

Public open space Area 03: 854 sqm

Covered Bicycle store

Bin store 03

Kickabout area

Public open space Area 07: 3975 sqm

Existing stone wall to be made good & supplemented where required

SITE NOTICE LOCATION

Possible future link to adjacent lands zoned LDR

Ornamental Mound

Rosshill Folly (Protected structure

NOTE : PLEASE REFER TO ENGINEERS DRAWINGS & REPORTS FOR SERVICE CONNECTION DETAILS

LEGEND

Site boundary outlined in red

OVERALL SITE AREA : **100,693 sqm :- 10.069HA :- 24.881 Acre**
Verges to Old Dublin Road & Rosshill Rd. **: 3,381 sqm :- 0.338 HA**
Junction area **: 628 sqm :- 0.063 HA**
RA zoned Land to west boundary **: 1,292 sqm :- 0.129 HA**
Developable Area : 95,392 sqm :- 9.539 HA :- 23.572 Acre

Galway City Council Development plan 2017-2023:
Site zoned Low Density Residential (LDR)

RESIDENTIAL TOTAL NO. OF UNITS = 342

Density:
35.8 Units per Ha - Residential Density (342 total units on 9.539 ha.)
14.5 Units per Acre - Residential Density (342 total units on 23.572 acre)

Plot ratio **: 0.36 :1** (max allowable 0.46:1)
Site Coverage **: 15.34%**

45.9% Apartments = 157 Units
54.1% Houses = 185 Units

Residential Dwelling Units:

Type 'A-A6'	- 4 bed Semi -Detached	- Circa 125.4 sqm	TOTAL 36 UNITS
Type 'A2'	- 4 bed Detached	- Circa 125.4sqm	TOTAL 02 UNITS
Type 'B-B7'	- 3 bed Semi -D	- Circa 110.4 sqm	TOTAL 24 UNITS
Type 'C-C8'	- 3 bed Semi -D	- Circa 108.2 sqm	TOTAL 44 UNITS
Type 'C-C10'	- 3 bed Terrace	- Circa 108.2 sqm	TOTAL 63 UNITS
Type 'D'	- 2 bed Terrace	- Circa 84.4 sqm	TOTAL 06 UNITS
Type 'E'	- 3 bed Long semi-D	- Circa 107 sqm	TOTAL 05 UNITS
Type 'F'	- 4 bed Long semi-D	- Circa 129.8 sqm	TOTAL 05 UNITS

TOTAL UNITS ON SITE = 185 UNITS

Apartment Units:

Type '1A- 1D'	- 1 bed Apartment	- Circa 49.2sqm (varies) TOTAL 038 UNITS
Type '2A - 2N'-	2 bed Apartment	- Circa 78sqm(varies) TOTAL 119 UNITS

TOTAL UNITS ON SITE = 157 UNITS

Public open space requirement over developable area: 15% - 14,309sqm
Public open space provided- Over 21,533sqm - 22.57%
(above 10m wide/ 200sqm & reasonably level usable space)
Overall Green and landscaped space across the site: 25,130sqm - 25.8%

Overall site Mix:

038 no. 1 Bedroom units	11.1%
125 no. 2 Bedroom units	36.5%
136 no. 3 Bedroom units	39.8%
043 no. 4 Bedroom units	12.6%
	100%

Mix by type:

157 Apartments	45.9%
069 Terraces	20.2%
114 Semi-Detached	33.3%
002 Detached	00.6%
	100%

01 PART 02 Site Layout Plan
Scale: 1:500

02 Location key
Scale: n.t.s

Part 01 Part 02

REVISIONS

No.	Date	Comments	By

REVISIONS

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Scale: 1:500	Drawing Purpose: PLANNING	File Ref. 3.09	Subject: PART 02 - SITE LAYOUT PLAN - FINALISED RED LINE	Project No. 18128	Drawing No. 3004	Rev. -

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APPENDIX 7

RELEVÉ DATA

Relevé 1 Semi-improved dry neutral grassland, grid reference: 34244 24936

Common Name	Scientific Name	Percentage cover
Yorkshire fog	*Holcus lanatus*	60%
Creeping thistle	*Cirsium arvense*	15%
Curled dock	*Rumex crispus*	7%
Common mouse-ear	*Cerastium fontanum*	2%
Creeping buttercup	*Ranunculus repens*	3%
Common sorrel	*Rumex acetosa*	3%
Ragwort	*Senecio jacobaea*	3%
Rough meadow grass	*Poa trivialis*	5%
Common bent	*Agrostis capillaris*	5%
Cleavers	*Galium aparine*	+

Relevé 2 Semi-improved dry neutral grassland, grid reference: 34262 25034

Common Name	Scientific Name	Percentage cover
Yorkshire fog	*Holcus lanatus*	40%
Creeping buttercup	*Ranunculus repens*	25%
Common sorrel	*Rumex acetosa*	15%
Sweet vernal grass	*Anthoxanthum odoratum*	3%
Rough meadow grass	*Poa trivialis*	5%
Common bent	*Agrostis capillaris*	4%
Cock's foot	*Dactylis glomerata*	2%
Hogweed		+
Knapweed	*Centaurea nigra*	+
Ribwort plantain	*Plantago lanceolata*	1
Common mouse-ear	*Cerastium fontanum*	2%
Red clover	*Trifolium pretense*	+

Relevé 3 Semi-improved Dry neutral grassland (close to field boundary), grid reference: 34273 25060

Common Name	Scientific Name	Percentage cover
Yorkshire fog	*Holcus lanatus*	20%
Common bent	*Agrostis capillaris*	25%
Sweet vernal grass	*Anthoxanthum odoratum*	10%
Common sorrel	*Rumex acetosa*	7%
Common mouse-ear	*Cerastium fontanum*	1%
Knapweed	*Centaurea nigra*	3-4%
Selfheal	*Prunella vulgaris*	1-2%
Meadow buttercup	*Ranunculus acris*	7%
White clover	*Trifolium repens*	3%
Creeping buttercup	*Ranunculus repens*	+
Ribwort plantain	*Plantago lanceolata*	4%
Yarrow	*Alchemilla millefolium*	1%
Red clover	*Trifolium pretense*	+
Rough meadow grass	*Poa trivialis*	2%
False oat grass	*Arrhenatherum elatius*	+
Germander speedwell	*Veronica chamaedrys*	+
Dandelion	*Taraxacum officinale agg.*	+
Smooth hawksbeard	*Crepis capillaris*	+

Relevé 4 Oak-ash-hazel woodland (WN2), grid reference: 34168 25049

Common Name	Scientific Name	Percentage cover
Ash	*Fraxinus excelsior*	30%
Beech	*Fagus sylvatica*	50%
Sycamore	*Acer pseudoplatanus*	5%
Hazel		15%
Hawthorn	*Crataegus monogyna*	7%
Ivy	*Hedera helix*	20%
Lords and ladies	*Arum maculatum*	1%
Herb Robert	*Geranium robertianum*	+
Wood avens	*Geum urbanum*	+
Hart's tongue		+
	Brachythecium rutuabulum	5%
	Thamnobryum alopercum	2%
Bare ground / Litter		85%

Relevé 5 Wet grassland, grid reference: 34087 25021

Common Name	Scientific Name	Percentage cover
Yorkshire fog	*Holcus lanatus*	20%
Common bent	*Agrostis capillaris*	20%
Sweet vernal grass	*Anthoxanthum odoratum*	2%
Crested dog's tail	*Cynosurus cristatus*	6%
Marsh thistle	*Cirsium palustre*	5%
Creeping buttercup	*Ranunculus repens*	30%
Compact rush	*Juncus conglomeratus*	8%
Common sorrel	*Rumex acetosa*	7%
Curled dock	*Rumex crispus*	2%
White clover	*Trifolium repends*	4%
Rough meadow grass	*Poa trivialis*	1%
False oat grass	*Arrhenatherum elatius*	2%
Dandelion	*Taraxacum officinale agg.*	+

Relevé 6 Dry calcareous grassland, grid reference: 34413 25068

Common Name	Scientific Name	Percentage cover
Red clover	*Trifolium pretense*	25%
Selfheal	*Prunella vulgaris*	10%
Glaucous sedge	*Carex flacca*	10%
Common mouse-ear	*Cerastium fontanum*	1%
White clover	*Trifolium repends*	3%
Centaury	*Centaurium erythyraea*	4%
Black medick	*Medicago lupulina*	20%
Dandelion	*Taraxacum officinale agg.*	1%
Common sorrel	*Rumex acetosa*	2%
Crested dog's tail	*Cynosurus cristatus*	3%
Sweet vernal grass	*Anthoxanthum odoratum*	10%
Yorkshire fog	*Holcus lanatus*	3%
Silverweed	*Potentilla anserina*	1%
Meadow buttercup	*Ranunculus acris*	1%
Tufted vetch	*Vicia cracca*	+
Ribwort plantain	*Plantago lanceolata*	5%
Hawkbit	*Leontodon sp.*	+
Sheep's fescue	*Festuca ovina*	30%
	Calliergonella cuspidata	10%
Compact rush	*Juncus conglomeratus*	2%
Ragwort	*Senecio jacobaea*	4%

APPENDIX 8

TARGETS AND ATTRIBUTES OF RELEVANT QIs AND SCIs

ISSN 2009-4086

National Parks and Wildlife Service

Conservation Objectives Series

Galway Bay Complex SAC 000268

An Roinn
Ealaíon, Oidhreachta agus Gaeltachta
Department of
Arts, Heritage and the Gaeltacht

1140 Mudflats and sandflats not covered by seawater at low tide

To maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide in Galway Bay Complex SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes. See map 3	Habitat area was estimated using OSi data as 744ha
Community distribution	Hectares	Conserve the following community types in a natural condition: Intertidal sandy mud community complex; and Intertidal sand community complex. See map 7	Based on intertidal surveys undertaken in 2009 and 2010 (RPS, 2012). See marine supporting document for further information

1150 Coastal lagoons

To restore the favourable conservation condition of Coastal lagoons in Galway Bay Complex SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable, subject to slight natural variation. Favourable reference area 76.7ha. See map 4	Areas calculated from spatial data derived from Oliver, 2007. Site codes IL037, IL038, IL039, IL046, IL047, IL048, IL049, IL050, IL051, IL052. NB there may be more, as yet unmapped, lagoons within this SAC. See lagoon supporting document for further details
Habitat distribution	Occurrence	No decline, subject to natural processes. See map 4 for mapped lagoons	Sites IL037, IL038, IL039, IL046, IL047, IL048, IL049, IL050, IL051, IL052 in Oliver, 2007. NB there may be more, as yet unmapped, lagoons within this SAC. See lagoon supporting document for further details
Salinity regime	Practical salinity units (psu)	Median annual salinity and temporal variation within natural ranges	The lagoons in the site vary from oligohaline to euhaline. See lagoon supporting document for further details
Hydrological regime	Metres	Annual water level fluctuations and minima within natural ranges	Most of the lagoons listed for this site are considered to be shallow; however, Aughinish lagoon and Lough Atalia do have deeper (at least 3m) parts. See lagoon supporting document for further details
Barrier: connectivity between lagoon and sea	Permeability	Appropriate hydrological connections between lagoons and sea, including where necessary, appropriate management	The lagoons within this site exhibit a variety of barrier types including cobble/shingle, karst and artificial embankment/causeway. Several are recorded as having sluices. See lagoon supporting document for further details
Water quality: Chlorophyll *a*	µg/L	Annual median chlorophyll *a* within natural ranges and less than 5µg/L	Target based on Roden and Oliver (2010). See lagoon supporting document for further details
Water quality: Molybdate Reactive Phosphorus (MRP)	mg/L	Annual median MRP within natural ranges 0.1mg/L	Target based on Roden and Oliver (2010). See lagoon supporting document for further details
Water quality: Dissolved Inorganic Nitrogen (DIN)	mg/L	Annual median DIN within natural ranges and less than 0.15mg/L	Target based on Roden and Oliver (2010). See lagoon supporting document for further details
Depth of macrophyte colonisation	Metres	Macrophyte colonisation to at least 2m depth	For shallow lagoons, it is expected that macrophytes should extend to their deepest points. See lagoon supporting document for further details
Typical plant species	Number and m^2	Maintain number and extent of listed lagoonal specialists, subject to natural variation	Species listed in Oliver, 2007. See lagoon supporting document for further details
Typical animal species	Number	Maintain listed lagoon specialists, subject to natural variation	Species listed in Oliver, 2007. See lagoon supporting document for further details
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. See lagoon supporting document for further details

1160 Large shallow inlets and bays

To maintain the favourable conservation condition of Large shallow inlets and bays in Galway Bay Complex SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes. See map 5	Habitat area was estimated as 10,825ha using OSi data and the Transitional Water Body area as defined under the Water Framework Directive
Community extent	Hectares	Maintain the extent of the *Zostera*-dominated community complex and the maërl-dominated community, subject to natural processes. See map 7	Based on 2006 diver observation and dropdown camera data (MERC, 2006). See marine supporting document for further details
Community structure: *Zostera* density	Shoots per m²	Conserve the high quality of *Zostera*-dominated communities, subject to natural processes	2006 diver observation and dropdown camera data (MERC, 2006). See marine supporting document for further details
Community structure	Biological composition	Conserve the high quality of the maërl-dominated community, subject to natural processes	2006 diver observation and dropdown camera data (MERC, 2006). See marine supporting document for further details
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. See map 7	Based on intertidal and subtidal surveys undertaken in 2009 and 2010 (Aquafact, 2010a, b; RPS, 2012). See marine supporting document for further information

1170 Reefs

To maintain the favourable conservation condition of Reefs in Galway Bay Complex SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution	Occurrence	The distribution of reefs is stable or increasing, subject to natural processes. See map 6 for mapped distribution	Based on information from 2009 and 2010 intertidal survey data and 2009 subtidal survey data (Aquafact, 2010a, b; RPS, 2012). See marine supporting document for further details
Habitat area	Hectares	The permanent habitat area is stable, subject to natural processes. See map 6	Habitat area estimated as 2773ha using 2009 and 2010 intertidal survey data and 2009 subtidal survey data (Aquafact, 2010a, b; RPS, 2012)
Community extent	Hectares	Maintain the extent of the *Mytilus*-dominated reef community, subject to natural processes. See map 7	Area established from 2009 intertidal survey (RPS, 2012)
Community structure: *Mytilus* density	Individuals per m^2	Conserve the high quality of the *Mytilus*-dominated reef community, subject to natural processes	Based on intertidal survey 2009 (RPS, 2012) and intertidal walkover 2012
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 See map 7	Reef mapping based on information from 2009 subtidal reef survey (Aquafact, 2010b) and 2009 and 2010 intertidal surveys (RPS, 2012). See marine supporting document for further details

1310 Salicornia and other annuals colonising mud and sand

To maintain the favourable conservation condition of *Salicornia* and other annuals colonizing mud and sand in Galway Bay Complex SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession. For sub-sites mapped: Barna House - 0.067ha, Seaweed Point - 0.003ha, Roscam West and South - 0.023ha, Kilcaimin - 0.015, Kileenaran - 0.007ha, Kinvara West - 0.017ha, Scanlan's Island - 0.117ha, Tawin Island - 1.098ha. See map 9	Based on data from Saltmarsh Monitoring Project (SMP) (McCorry and Ryle, 2009). Habitat recorded at eight of the ten sub-sites surveyed and mapped, giving a total estimated area of 1.347ha. N.B. Further unsurveyed areas may be present within this site. See coastal habitats supporting document for further details
Habitat distribution	Occurrence	No decline, or change in habitat distribution, subject to natural processes. See map 9 for known distribution	Based on data from SMP (McCorry, 2007; McCorry and Ryle, 2009). *Salicornia* is an annual species, so its distribution can vary significantly from year to year. See coastal habitats supporting document for further details
Physical structure: sediment supply	Presence/ absence of physical barriers	Maintain/restore, natural circulation of sediments and organic matter, without any physical obstructions	Sediment supply is particularly important for pioneer saltmarsh community, as the distribution of this habitat depends on accretion rates. See coastal habitats supporting document for further details
Physical structure: creeks and pans	Occurrence	Maintain, or where necessary restore creek and pan structure, subject to natural processes, including erosion and succession	Based on data from SMP (McCorry, 2007; McCorry and Ryle, 2009). Creeks deliver sediment throughout saltmarsh system. Creeks and pan structures well developed at Kileenaran and Tawin Island. See coastal habitats supporting document for further details
Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime	This pioneer saltmarsh community requires regular tidal inundation. See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.	Based on data from SMP (McCorry, 2007; McCorry and Ryle, 2009). See coastal habitats supporting document for further details
Vegetation structure: vegetation height	Centimetres	Maintain structural variation within sward	Based on data from SMP (McCorry, 2007; McCorry and Ryle, 2009). See coastal habitats supporting document for details
Vegetation structure: vegetation cover	Percentage cover at a representative sample of monitoring stops	Maintain more than 90% of area outside creeks vegetated	Based on data from SMP (McCorry, 2007; McCorry and Ryle, 2009). See coastal habitats supporting document for details
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)	Based on data from SMP (McCorry, 2007; McCorry and Ryle, 2009). See coastal habitats supporting document for further details
Vegetation structure: negative indicator species - *Spartina anglica*	Hectares	There is currently no common cordgrass (*Spartina anglica*) in this SAC. Prevent establishment of cordgrass	Based on data from SMP (McCorry, 2007; McCorry and Ryle, 2009). See coastal habitats supporting document for further details

1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae)

To restore the favourable conservation condition of Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) in Galway Bay Complex SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area increasing, subject to natural processes, including erosion and succession. For sub-sites mapped: Barna House - 2.33ha, Seaweed Point - 1.41ha, Roscam West and South - 3.30ha, Oranmore North - 4.24ha, Kilcaimin - 6.82ha, Tawin Island - 53.85ha, Tyrone House-Dunbulcaun Bay - 9.83ha, Kileenaran - 15.37ha, Kinvara West - 13.33ha, Scanlan's Island - 4.13ha. See map 9	Based on data from Saltmarsh monitoring Project (SMP) (McCorry, 2007; McCorry and Ryle, 2009). Ten sub-sites that supported Atlantic salt meadow were mapped (114.612ha) and additional areas of potential saltmarsh (149.18ha) were identified by an examination of aerial photographs, giving a total estimated area of 263.80ha. NB further unsurveyed areas maybe present within the site. See coastal habitats supporting document for further details
Habitat distribution	Occurrence	No decline or change in habitat distribution, subject to natural processes. See map 9 for known distribution	Based on data from SMP (McCorry, 2007; McCorry and Ryle, 2009). See coastal habitats supporting document for further details
Physical structure: sediment supply	Presence/ absence of physical barriers	Maintain/restore natural circulation of sediments and organic matter, without any physical obstructions	See coastal habitats supporting document for further details
Physical structure: creeks and pans	Occurrence	Maintain creek and pan structure, subject to natural processes, including erosion and succession	Based on data from SMP (McCorry, 2007; McCorry and Ryle, 2009). The efficiency of sediment circulation throughout a saltmarsh depends on the creek pattern. Creeks and pans are well developed at both Tawin Island and Kileenaran. See coastal habitats supporting document for further details
Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime	See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	Based on data from SMP (McCorry, 2007; McCorry and Ryle, 2009). See coastal habitats supporting document for further details
Vegetation structure: vegetation height	Centimetres	Maintain structural variation within sward	Based on data from SMP (McCorry, 2007; McCorry and Ryle, 2009). See coastal habitats supporting document for further details
Vegetation structure: vegetation cover	Percentage cover at a representative sample of monitoring stops	Maintain more than 90% area outside creeks vegetated	Based on data from SMP (McCorry, 2007; McCorry and Ryle, 2009). See coastal habitats supporting document for further details
Vegetation composition: typical species and sub-communities	Percentage cover at a representative sample of monitoring stops	Maintain range of sub-communities with typical species listed in SMP (McCorry and Ryle, 2009)	Based on data from SMP (McCorry, 2007; McCorry and Ryle, 2009). See coastal habitats supporting document for further details
Vegetation structure: negative indicator species - *Spartina anglica*	Hectares	There is currently no common cordgrass (*Spartina anglica*) in this SAC. Prevent establishment of cordgrass	Based on data from SMP (McCorry, 2007; McCorry and Ryle, 2009). McCorry and Ryle, 2009). See coastal habitats supporting document for further details

1410 Mediterranean salt meadows (Juncetalia maritimi)

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:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession. For sub-sites mapped: Barna House - 0.282ha, Seaweed Point - 0.931ha, Kilcaimin - 0.005ha, Tawin Island - 1.799ha. Tyrone House- Dunbulcan Bay - 8.184ha, Kileenaran - 0.271ha. See map 9	Based on data from the Saltmarsh Monitoring Project (SMP) (McCorry, 2007; McCorry and Ryle, 2009). Six sub-sites that support Mediterranean salt meadow were mapped (11.472ha) and additional areas of potential saltmarsh (8.415ha) were identified from an examination of aerial photographs, giving a total estimated area of 19.887ha. NB further unsurveyed areas maybe present within the site. See coastal habitats supporting document for further details
Habitat distribution	Occurrence	No decline, subject to natural processes. See map 9 for known distribution	See coastal habitats supporting document for further details
Physical structure: sediment supply	Presence/absence of physical barriers	Maintain/restore natural circulation of sediments and organic matter, without any physical obstructions	See coastal habitats supporting document for further details
Physical structure: creeks and pans	Occurrence	Maintain creek and pan structure, subject to natural processes, including erosion and succession	Based on data from the SMP (McCorry, 2007; McCorry and Ryle, 2009). [Site-specific info.]. See coastal habitats supporting document for further details
Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime	Mediterranean salt meadows is found high up in the saltmarsh but requires occasional tidal inundation. [Site-specific info.] See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	Based on data from SMP (McCorry, 2007; McCorry and Ryle, 2009). See coastal habitats supporting document for further details
Vegetation structure: vegetation height	Centimetres	Maintain structural variation in the sward	Based on data from SMP (McCorry, 2007; McCorry and Ryle, 2009). See coastal habitats supporting document for further details
Vegetation structure: vegetation cover	Percentage cover at a representative sample of monitoring stops	Maintain more than 90% of area outside creeks vegetated	Based on data from SMP (McCorry, 2007; McCorry and Ryle (2009). See coastal habitats supporting document for further details
Vegetation composition: typical species and sub-communities	Percentage cover at a representative sample of monitoring stops	Maintain range of sub-communities with typical species listed in SMP (McCorry and Ryle, 2009)	Based on data from SMP (McCorry, 2007; McCorry and Ryle (2009). See coastal habitats supporting document for further details
Vegetation structure: negative indicator species - *Spartina anglica*	Hectares	There is currently no common cordgrass (*Spartina anglica*) in this SAC. Prevent establishment of cordgrass	Based on data from SMP (McCorry, 2007; McCorry and Ryle, 2009). See coastal habitats supporting document for further details

1355 Otter *Lutra lutra*

To restore the favourable conservation condition of Otter in Galway Bay Complex SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution	Percentage positive survey sites	No significant decline	Measure based on standard otter survey technique. FCS target, based on 1980/81 survey findings, is 88% in SACs. Current range in the west is estimated at 70% (Bailey and Rochford, 2006).
Extent of terrestrial habitat	Hectares	No significant decline. Area mapped and calculated as 262ha above high water mark (HWM); 14ha along river banks/around ponds	No field survey. Areas mapped to include 10m terrestrial buffer along shoreline (above HWM and along river banks) identified as critical for otters (NPWS, 2007)
Extent of marine habitat	Hectares	No significant decline. Area mapped and calculated as 2040ha	No field survey. Area mapped based on evidence that otters tend to forage within 80m of the shoreline (HWM) (NPWS, 2007; Kruuk, 2006)
Extent of freshwater (river) habitat	Kilometres	No significant decline. Length mapped and calculated as 4km	No field survey. River length calculated on the basis that otters will utilise freshwater habitats from estuary to headwaters (Chapman and Chapman, 1982)
Extent of freshwater (lake/lagoon) habitat	Hectares	No significant decline. Area mapped and calculated as 21ha	No field survey. Area mapped based on evidence that otters tend to forage within 80m of the shoreline (NPWS, 2007)
Couching sites and holts	Number	No significant decline	Otters need lying up areas throughout their territory where they are secure from disturbance (Kruuk, 2006; Kruuk and Moorhouse, 1991)
Fish biomass available	Kilograms	No significant decline	Broad diet that varies locally and seasonally, but dominated by fish, in particular salmonids, eels and sticklebacks in freshwater (Bailey and Rochford, 2006) and wrasse and rockling in coastal waters (Kingston et al., 1999)
Barriers to connectivity	Number	No significant increase. For guidance, see map 11	Otters will regularly commute across stretches of open water up to 500m e.g. between the mainland and an island; between two islands; across an estuary (De Jongh and O'Neill, 2010). It is important that such commuting routes are not obstructed

1365 Harbour seal *Phoca vitulina*

To maintain the favourable conservation condition of Harbour Seal in Galway Bay Complex SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Access to suitable habitat	Number of artificial barriers	Species range within the site should not be restricted by artificial barriers to site use. See map 12	See marine supporting document for further details
Breeding behaviour	Breeding sites	Conserve breeding sites in a natural condition. See map 12	Attribute and target based on background knowledge of Irish breeding populations, review of data summarised by Summers et al. (1980), Warner (1983), Harrington (1990), Doyle (2002), Lyons (2004), and unpublished NPWS records. See marine supporting document for further details
Moulting behaviour	Moult haul-out sites	Conserve moult haul-out sites in a natural condition. See map 12	Attribute and target based on background knowledge of Irish populations, review of data from Doyle (2002), Lyons (2004), Cronin et al. (2004), NPWS (2010, 2011, 2012) and unpublished NPWS records. See marine supporting document for further details
Resting behaviour	Resting haul-out sites	Conserve resting haul-out sites in a natural condition. See map 12	Attribute and target based on background knowledge of Irish populations, review of data from Doyle (2002), Lyons (2004) and unpublished NPWS records. See marine supporting document for further details
Disturbance	Level of impact	Human activities should occur at levels that do not adversely affect the harbour seal population at the site	See marine supporting document for further details

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Conservation Objectives Series

Inner Galway Bay SPA 004031

An Roinn
Ealaíon, Oidhreachta agus Gaeltachta

Department of
Arts, Heritage and the Gaeltacht

A003 Great Northern Diver *Gavia immer*

To maintain the favourable conservation condition of Great Northern Diver in Inner Galway Bay SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by great northern diver, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A046 Brent Goose *Branta bernicla hrota*

To maintain the favourable conservation condition of Light-bellied Brent Goose in Inner Galway Bay SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	No significant decrease in the range, timing and intensity of use of areas by light-bellied brent goose, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A028 Grey Heron *Ardea cinerea*

To maintain the favourable conservation condition of Grey Heron in Inner Galway Bay SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	No significant decrease in the range, timing and intensity of use of areas used by grey heron, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A017 Cormorant *Phalacrocorax carbo*

To maintain the favourable conservation condition of Cormorant in Inner Galway Bay SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Breeding population abundance: apparently occupied nests (AONs)	Number	No significant decline	This attribute applies to breeding cormorant. Measure based on standard survey methods (see Walsh et al., 1995). The Seabird Monitoring Programme (SMP) online database (JNCC, 2013) provides population data for this species. A recent survey of Deer Island (conducted in 2010) estimated 128 AONs at this colony, which represents an approximate decline of 38% since 1985
Productivity rate	Mean number	No significant decline	This attribute applies to breeding cormorant. Measure based on standard survey methods (see Walsh et al., 1995). The Seabird Monitoring Programme (SMP) online database (JNCC, 2013) provides population data for this species
Distribution: breeding colonies	Number; location; area (hectares)	No significant decline	This attribute applies to breeding cormorant. Cormorant colonies are usually sited on flat or rocky islets or sea stack tops, less often on cliffs (Walsh et al., 1995). Deer Island is a traditional breeding colony in this SPA
Prey biomass available	Kilogrammes	No significant decline	This attribute applies to breeding cormorant. Key prey items: fish (mostly benthic), some crustaceans. Key habitats: cormorants use sandy areas as well as rocky and vegetated substrates. Foraging range: max. 50km, mean max. 31.67km, mean 8.46km (BirdLife International Seabird Database (Birdlife International, 2013))
Barriers to connectivity	Number; location; shape; area (hectares)	No significant increase	This attribute applies to breeding cormorant. Seabird species make extensive use of the marine waters adjacent to their breeding colonies. Foraging range: max. 50km, mean max. 31.67km, mean 8.46km (BirdLife International Seabird Database (Birdlife International, 2013))
Disturbance at breeding site	Level of impact	Human activities should occur at levels that do not adversely affect the breeding cormorant population	This attribute applies to breeding cormorant. Cormorant colonies are usually sited on flat or rocky islets or sea stack tops, less often on cliffs (Walsh et al., 1995). Deer Island is a traditional breeding site
Population trend	Percentage change	Long term population trend stable or increasing	This attribute applies to non-breeding cormorant. Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	No significant decrease in the numbers or range of areas used by cormorant, other than that occurring from natural patterns of variation	This attribute applies to non-breeding cormorant. Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A050 Wigeon *Anas penelope*

To maintain the favourable conservation condition of Wigeon in Inner Galway Bay SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Number, range, timing and intensity of areas used by waterbirds	No significant decrease in the range, timing or intensity of use of areas by wigeon, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A052 Teal *Anas crecca*

To maintain the favourable conservation condition of Teal in Inner Galway Bay SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	No significant decrease in the range, timing or intensity of use of areas by teal, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A056 Shoveler *Anas clypeata*

To maintain the favourable conservation condition of Shoveler in Inner Galway Bay SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	No significant decrease in the range, timing or intensity of use of areas by shoveler, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A069 Red-breasted Merganser *Mergus serrator*

To maintain the favourable conservation condition of Red-breasted Merganser in Inner Galway Bay SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	No significant decrease in the range, timing and intensity of use of areas by red-breasted merganser, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A137 Ringed Plover *Charadrius hiaticula*

To maintain the favourable conservation condition of Ringed Plover in Inner Galway Bay SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	No significant decrease in the range, timing or intensity of use of areas by ringed plover, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of conservation objectives supporting document

A140 Golden Plover *Pluvialis apricaria*

To maintain the favourable conservation condition of Golden Plover in Inner Galway Bay SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of theconservation objectives supporting document
Distribution	Number, range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by golden plover, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A142 Lapwing *Vanellus vanellus*

To maintain the favourable conservation condition of Lapwing in Inner Galway Bay SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Number, range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by lapwing, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives

A149 Dunlin *Calidris alpina alpina*

To maintain the favourable conservation condition of Dunlin in Inner Galway Bay SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Number, range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by dunlin, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A157 Bar-tailed Godwit *Limosa lapponica*

To maintain the favourable conservation condition of Bar-tailed Godwit in Inner Galway Bay SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Number, range, timing and intensity of use of areas	There should be no significant decrease in the range, timing or intensity of use of areas by bar-tailed godwit, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A160 Curlew *Numenius arquata*

To maintain the favourable conservation condition of Curlew in Inner Galway Bay SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Number, range, timing and intensity of use of areas	There should be no significant decrease in the range, timing or intensity of use of areas by curlew, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A162 Redshank *Tringa totanus*

To maintain the favourable conservation condition of Redshank in Inner Galway Bay SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Number, range, timing and intensity of use of area	There should be no significant decrease in the range, timing or intensity of use of areas by redshank, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A169 Turnstone *Arenaria interpres*

To maintain the favourable conservation condition of Turnstone in Inner Galway Bay SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	There should be no significant decrease in the range, timing or intensity of use of areas by turnstone, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A179 Black-headed Gull *Chroicocephalus ridibundus*

To maintain the favourable conservation condition of Black-headed Gull in Inner Galway Bay SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	There should be no significant decrease in the range, timing and intensity of use of areas used by black-headed gull other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A182 Common Gull *Larus canus*

To maintain the favourable conservation condition of Common Gull in Inner Galway Bay SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	No significant decrease in the range,timing or intensity of use of areas by the common gull, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A191 Sandwich Tern *Sterna sandvicensis*

To maintain the favourable conservation condition of Sandwich Tern in Inner Galway Bay SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Breeding population abundance: apparently occupied nests (AONs)	Number	No significant decline	Measure based on standard tern survey methods (see Walsh et al., 1995). Hannon et al. (1997) and Mitchell et al. (2004) provide summary population information. The Seabird Monitoring Programme (SMP) online database (JNCC, 2013) provides population data for this species
Productivity rate: fledged young per breeding pair	Mean number	No significant decline	Measure based on standard tern survey methods (see Walsh et al., 1995). The Seabird Monitoring Programme (SMP) online database (JNCC, 2013) provides population data for this species
Distribution: breeding colonies	Number; location; area (Hectares)	No significant decline	Typical sandwich tern breeding sites are located on low-lying offshore islands or islets in bays or brackish lagoons on spits or remote mainland dunes (Cramp, 1985). Wide fluctuations between years in both breeding numbers and colony locations are known to occur for this species (Mitchell et al., 2004)
Prey biomass available	Kilogrammes	No significant decline	Key prey items: Mostly energy-rich fish, some crustaceans and occasionally insects and rag worms. Key habitats: sandwich tern forage in/over shallow marine waters such as bays, inlets and outflows, gullies, shoals, inshore waters, reefs, and sandbanks; also more open waters nearshore and offshore, including open sea. Foraging range: max. 70km, mean max. 42.3km, mean 14.7km (BirdLife International Seabird Database (Birdlife International, 2013))
Barriers to connectivity	Number; location; shape; area (hectares)	No significant increase	Seabird species can make extensive use of the marine waters adjacent to their breeding colonies. Foraging range: Max 70km, mean max 42.3km, mean 14.7km (Birdlife International Seabird Database (Birdlife International, 2013))
Disturbance at breeding site	Level of impact	Human activities should occur at levels that do not adversely affect the breeding sandwich tern population	Typical sandwich tern breeding sites are located on low-lying offshore islands or islets in bays or brackish bagoons on spits or remote mainland dunes (Cramp, 1985)

A999 Wetlands

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 target:

Attribute	Measure	Target	Notes
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	The wetland habitat area was estimated as 13,267ha using OSi data and relevant orthophotographs. For further information see part three of the conservation objectives supporting document

APPENDIX 8

CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN (CEMP)

Planning and Environmental Consultants

Construction and Environmental Management Plan (CEMP)

Strategic Housing Development, Rosshill

DOCUMENT DETAILS

Client:	**Kegata Ltd.**
Project Title:	**Strategic Housing Development, Rosshill**
Project Number:	**181058-a**
Document Title:	**Construction and Environmental Management Plan (CEMP)**
Document File Name:	**CEMP F – 2019.12.12 – 181058-a**
Prepared By:	**MKO** **Tuam Road** **Galway** **Ireland** **H91 VW84**

Planning and Environmental Consultants

Rev	Status	Date	Author(s)	Approved By
01	Draft	15/10/2019	EG	OC
02	Final	12/12/2019	EG	OC

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Appendix 1 Site Drainage Plan

1. INTRODUCTION

1.1 General Introduction

This Construction and Environmental Management Plan (CEMP) has been developed by McCarthy Keville O' Sullivan Ltd. (MKO) on behalf of Kegata Limited, which intends to apply to An Bord Pleanála (ABP) under the Planning and Development Act 2000 (as amended by the Residential Tenancies Act 2016) for a strategic housing scheme located in the townlands of Roscam, Merlin Park and Murrough to the south east of Galway City. The application is being made under the Strategic Housing Provisions of the Planning and Development (Housing) and Residential Tenancies Act, 2016. The CEMP will require further updating and final agreement with the various stakeholders should the project secure Planning Permission, in line with all conditions which apply and in order to identify, assess and satisfy the contract performance criteria. The final CEMP will also require updating by the selected contractor.

This report provides the environmental management framework to be adhered to during the pre-commencement, construction and operational phases of the proposed development and it incorporates the mitigating principles to ensure that the work is carried out in a way that minimises the potential for any environmental impacts to occur. This report has been prepared in accordance with the mitigation measures and commitments made in the Environmental Impact Assessment Report and other planning submissions for the development.

This CEMP identifies for the incoming Contractor, the key planning and environmental considerations that must be adhered to and delivered during site construction. This report is intended as a single, amalgamated document that can be used during the future phases of the project, as a single consolidated point of reference relating to all construction, , environmental and drainage requirements for the Planning Authority, developer and contractors alike.

1.2 Scope of Construction and Environmental Management Plan

This report is presented as a guidance document for the management of construction activities and waste materials generated during the works and following completion. It outlines clearly the mitigation measures that are required to be adhered to in order to manage activities and waste materials in an appropriate manner. The report is divided into six sections, as outlined below.

Section 1 provides a brief introduction as to the scope of the report.

Section 2 outlines the site and project details and an overview of the proposed works along with detailing the targets and objectives of this plan.

Section 3 sets out details of the environmental management plan for the site as well as the environmental controls on site in particular noise and dust controls and the protection of water quality. A construction and demolition waste management plan is also provided.

Section 4 sets out a fully detailed implementation plan for the environmental management of the proposed project outlining the roles and responsibilities of the project team as well as an emergency response procedure in terms of site health and safety and environmental protection.

Section 5 consists of a summary table of all mitigation proposals to be adhered to during the implementation of the proposed project, categorised into two separate headings, 1) pre-commencement measures; 2) construction-phase measures.

Section 6 provides details of the compliance review process to ensure all commitments set out in this document are being adhered to by means of audit and inspection.

2. SITE AND PROJECT DETAILS

2.1 Site Location

The site area comprises approximately 10ha of land located within the townlands of Roscam, Merlin Park and Murrough, Galway City. The proposed site is located within the eastern suburbs of Galway, approximately 4 kilometres from the city centre. A site location map is presented in Figure 2.1 with the site location highlighted in red.

2.2 Description of the Proposed Development

Planning permission is sought by Kegata Limited for a 7-year permission for development on a site which extends to 10.0693 ha in the townlands of Roscam, Merlin Park and Murrough in Galway City. The proposed development will consist of the following:

1. *Construction of 342 no. residential units comprising:*

    - *36no. Four Bed Semi-Detached Houses*
    - *2 no. Four Bed Detached Houses*
    - *68 no. Three Bed Semi-Detached Houses*
    - *63 no. Three Bed Terrace*
    - *6 no. Two Bed Terrace*
    - *5 no. Three Bed Long Semi-Detached Houses*
    - *5 no. Four Bed Long Semi-Detached Houses*
    - *38 no. One Bed Apartments*
    - *119 no. Two Bed Apartments*

2.3 Targets and Objectives

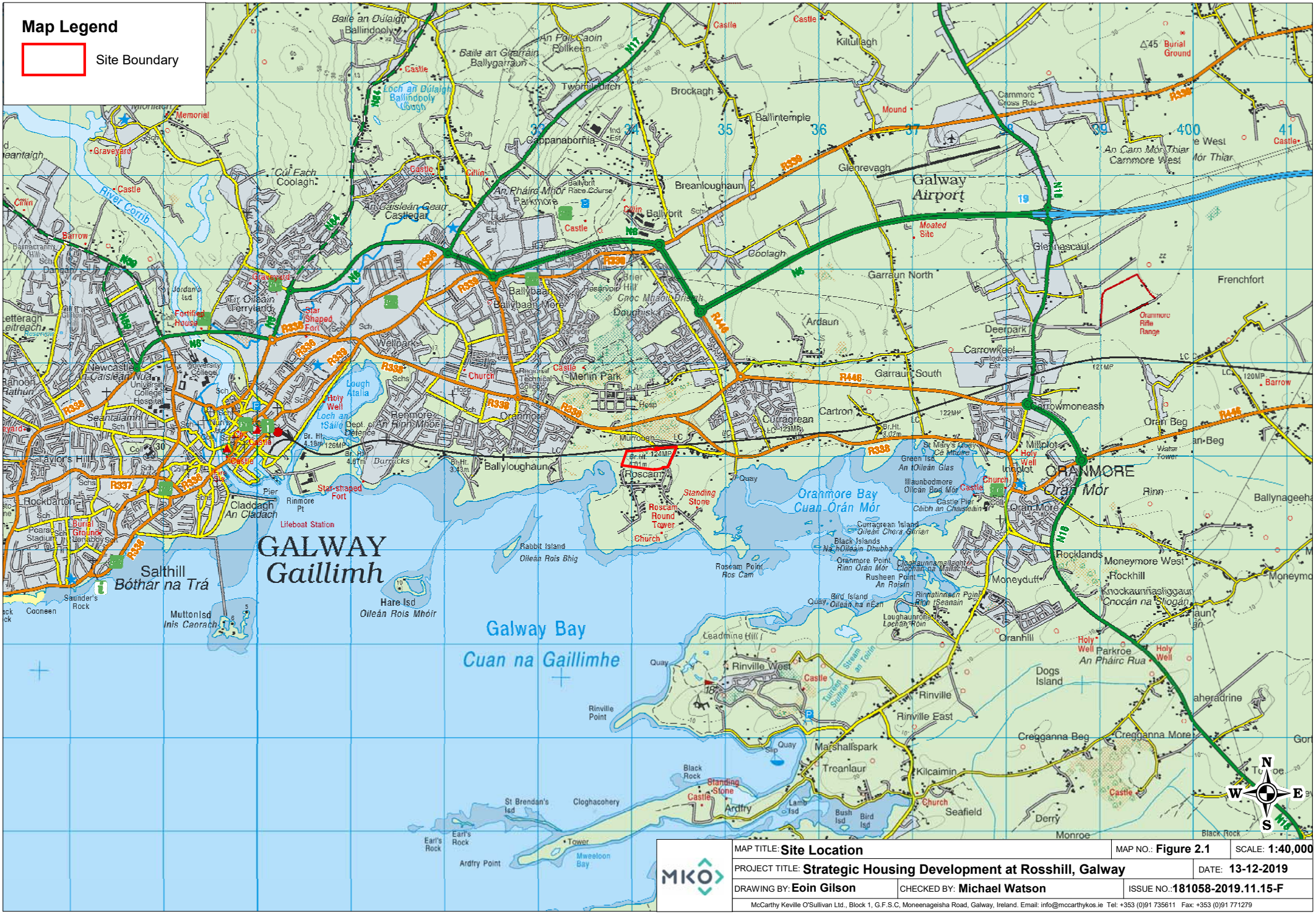
The key site targets are as follows;

- Ensure construction works and activities are completed in accordance with mitigation and best practice approach as presented in the Natura Impact Statement (NIS) and associated planning documentation;
- Ensure construction works and activities are completed in accordance with all planning conditions for the development;
- Ensure construction works and activities have minimal impact/disturbance to local landowners and the local community;
- Ensure construction works and activities have minimal impact on the Natural Environment;
- Adopt a sustainable approach to construction; and,
- Provide adequate environmental training and awareness for all project personnel.

The key site objectives are as follows;

- Using recycled materials if possible, including material generated during the proposed demolition of existing ruins e.g. excavated soil, stone and clean inert material;
- Ensure sustainable sources for materials supply where possible;
- Avoidance of any pollution incident or near miss as a result of working around or close to existing watercourses and having emergency measures in place;
- Avoidance of vandalism;
- Keeping all watercourses free from obstruction and debris;
- Keep impact of construction to a minimum on the local environment, watercourses and wildlife;
- Correct fuel storage and refuelling procedures to be followed;

- Good waste management and house-keeping to be implemented;
- Air and noise pollution prevention to be implemented; and,
- Monitoring of the works and any adverse effects that it may have on the environment.
- Construction Methods and designs will be altered where it is found there is an adverse effect on the environment;
- Comply with all relevant water quality legislation;
- Ensure a properly designed, constructed and maintained drainage system appropriate to the requirements of the site is kept in place at all times.



Map Legend

☐ Site Boundary

MAP TITLE: **Site Location**

MAP NO.: **Figure 2.1**

SCALE: **1:40,000**

PROJECT TITLE: **Strategic Housing Development at Rosshill, Galway**

DATE: **13-12-2019**

DRAWING BY: **Eoin Gilson**

CHECKED BY: **Michael Watson**

ISSUE NO.: **181058-2019.11.15-F**

MKO

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2.4 Construction Methodologies Overview

2.4.1 Introduction

An experienced main contractor will be appointed for the civil works for the construction phase. The main contractor for the works will be required to comply with this CEMP and any revisions made to this document. An overview of the proposed Construction Methodologies is provided below under the following main headings:

- Site Enabling Works
- Temporary Site Compound
- Perimeter Hoarding
- Demolition of ruins and concrete storage area
- Site Excavation
- Site Roads
- Services and Utilities
- House Construction
- Landscaping Works

2.4.2 Site Enabling Works

The site will be accessed from the east of the site off the Rosshill Road at the proposed vehicular access location. Prior to the commencement of any construction, this site entrance will need to be fully established with security gates. A parking area for construction worker's vehicles will be provided within the confines of the site. There will be no parking permitted for any vehicles associated with the project on the public road during the construction phase of the development.

2.4.3 Temporary Site Compound

A temporary construction compound is proposed for the construction phase of the proposed development, located inside the development footprint. The proposed temporary compound area incorporates temporary site offices, staff facilities and car-parking areas.

A dedicated waste management area will be located within the compound, with waste to be sorted and collected from site by permitted collectors.

Temporary toilets located at the site offices and welfare facilities will be used during the construction phase. Wastewater from staff toilets will be directed to a sealed storage tank, with all wastewater being tankered off site by permitted waste collector to wastewater treatment plants. Power will be supplied by a diesel generator, located within the compound or via a temporary power supply if available. The construction compound will be used for temporary storage of some construction materials, prior to their delivery to the required area of the site.

2.4.4 Perimeter Hoarding

Perimeter hoarding will be provided around the site to provide a barrier against unauthorised access from the public areas. A controlled access point in the form of a gated main site entrance will be kept locked outside of normal working hours.

The hoarding will be well maintained and painted or covered with graphics portraying project information. Due to the nature of the works and the construction traffic using the site entrance, appropriate signage will be provided along the footpath and site entrance to alert pedestrians to the traffic exiting/entering the site. Likewise, appropriate signage will be installed within and outside the site to alert drivers of the pedestrians crossing ahead.

2.4.5 Demolition of Existing Buildings

There are a total of three ruined masonry outbuildings on the proposed site all of which are in various stages of disrepair.

Standard best practice construction methodologies will be adhered to during the demolition process. All buildings will be demolished by means of mechanical excavator. Where possible, the stone from the buildings will be reused on-site for infilling and landscaping works. The management of waste materials generated during the demolition phase is detailed in Section 3 of this document. All buildings to be demolished are detailed in Drawing no. 3008.

2.4.6 Site Excavation

Soil stripping and temporary stockpiling of soils and subsoils will be required around the site as the proposed development progresses. Where these works occur, the following will apply:

- The area where excavations are planned will be surveyed and all existing services will be identified.
- All relevant bodies i.e. ESB, Gas Networks Ireland, Eir, Galway City Council etc. will be contacted and all drawings for all existing services sought.
- All plant operators and general operatives will be inducted and informed as to the location of any services.
- All plant operators and general operatives will be inducted and informed as to the identification of invasive species.
- A tracked 360-degree excavator will be used to strip the topsoil, and a dumper will be used to move the excavated materials to the temporary stockpile location.
- All excavated material will be reused for future landscaping works or for backfill of excavations.
- All stockpiles will be damped down or covered in a sheet of polythene, as required, which will prevent the creation of nuisance dust, and will also prevent sediment runoff in times of heavy precipitation.

2.4.7 Site Roads

The construction methodology for the proposed access road is outlined as follows:

- Excavation will take place until a competent stratum is reached.
- The competent stratum will be overlain with up to 500mm of granular fill.
- A layer of geogrid/geotextile may be required at the surface of the competent stratum.
- A final hard surface layer will be placed over the excavated road to provide a road profile to accommodate construction traffic.
- Prior to completion of the construction works on site, the finished asphalt road surface will be applied.

2.4.8 Services and Utilities

The proposed on-site foul sewers will discharge by gravity to a pumping station to the northwest of the site, and the foul waste will discharge from this pumping station via pumped rising main to the adjacent public (Irish Water) foul sewer network.

It is proposed that the development will drain via gravity to 12 no. soakaways proposed on site. Water draining to soakaways will pass through silt traps and hydrocarbon interceptors prior to reaching each soakaway. No surface water from roofs or paved surfaces will be discharge from the site, other than via the soakaways to ground.

The site drainage details are included in Appendix 1.

The installation of services and connections to the residential units will be carried out as follows:

- The area where excavations are planned will be surveyed and all existing services will be identified.
- All relevant bodies i.e. ESB, Gas Networks Ireland, Eir, Galway City Council etc. will be contacted and all drawings for all existing services sought.
- A traffic management plan will be produced if required for connection works to the existing service network.
- A road opening licence will be obtained where required for connection to existing services.
- All plant operators and general operatives will be inducted and informed as to the location of any services.
- A tracked 360-degree excavator or similar will be used to excavate the trench to the required dimensions.
- All excavated material will be removed to an authorised waste recovery facility or, if suitable, stock piled and reused for backfilling and landscaping where appropriate.
- Once the trench has been excavated the ducting/pipework will then be placed in the trench as per specification.
- Once the service ducts/pipework has been installed couplers will be fitted as required and capped to prevent any dirt etc. entering the ducts/pipes.
- The as built location of the ducting/pipework will be surveyed using a total station/GPS.
- Backfill material will be carefully placed so as not to displace the ducting/pipework within the trench.
- The appropriate warning/marker tape will be installed above the ducts/pipes at the appropriate depths.
- The surface will be reinstated as per original specification or to the requirements of the site layout/Local Authority as appropriate.

2.4.9 Existing Underground Services

Any underground services encountered during the works will be surveyed for level and where possible will be left in place. If there is a requirement to move the service, then the appropriate body (ESB, Gas Networks Ireland, etc.) will be contacted, and the appropriate procedure put in place. Back fill around any utility services will be with dead sand/pea shingle where appropriate. All works will be in compliance with required specifications.

2.4.10 House Construction

The housing units will be constructed by the following methodology:

- The area where excavations are foundations are to be installed will be surveyed and all existing services will be identified.
- All relevant bodies i.e. ESB, Gas Networks Ireland, Eir, Galway City Council etc. will be contacted and all drawings for all existing services sought.
- The area of each building will be marked out using ranging rods or wooden posts and the soil and overburden stripped and removed to nearby storage area for later use in landscaping.
- All plant operators and general operatives will be inducted and informed as to the location of any services.
- A tracked 360-degree excavator or similar will be used to excavate the area down to the level indicated by the designer and appropriately shuttered reinforced concrete will be laid over it;
- The block work walls will be built up from the foundation (including a DPC) and the floor slab constructed, having first located any ducts or trenches required by the follow on mechanical and electrical contractors;

- The block work will then be raised to wall plate level and the gables & internal partition walls formed. Scaffold will be erected around the outside of the buildings for this operation;
- Any concrete flooring slabs will be lifted into position using an adequately sized mobile crane;
- The timber roof trusses will then be lifted into position using a teleporter or mobile crane depending on site conditions. The roof trusses will then be felted, battened, tiled and sealed against the weather.
- Windows, electrics, plumbing and all other building components and services will be installed in as timely a manner as is possible.
- Each building will be inspected and certified by the project design engineer at the appropriate stages of construction.

2.4.11 Landscaping Works

Prior to completion of works on the development site, the landscaping works will be carried out. The finishes include areas of amenity grassland and tree planting. This work will be carried out before the completion of each phase in order to ensure that the development will be aesthetically pleasing place for residents to live. These works will involve the use of plant and machinery in order to carry out tasks such as earth moving. Materials which have been stockpiled for the task will be used as much as possible, and material will only be imported where it is required. Solid barriers will be erected around the site boundary for the duration of the construction works.

2.4.12 Construction Works Sequence

The sequencing of construction phase works has is summarised Table 2-1. This provides a schedule of the expected sequence of operations for the works to be completed during the construction phase.

Table 2-1 Sequence of Operations for the Construction Phase

No.	Waste Materials Arising
1	Foundations excavation and formation level establishment
2.	Foundations: formwork and steel reinforcement installation
3.	Masonry Blockwork: including insulation installation
4.	Carpentry 1st fix: timber roof structure and coverings
5.	Window/Door installation
6.	Plastering (external)
7.	Painting (external)
8.	Internal services (electrical and plumbing)
9.	Plastering (internal)
10.	Floor: Sand and cement screed
11.	Services connection: electrical, sewage, telecoms.
12.	Painting (internal)
13.	Tiling: Floors, walls etc.
14.	Carpentry 2nd fix: doors, flooring etc.
15.	Landscaping
16.	Road finishes: Tarmacadam roads and parking areas

3. ENVIRONMENTAL MANAGEMENT

3.1 Site Drainage

Prior to the commencement of any construction activities, the necessary mitigation measures will be put in place to ensure the protection of surface water during the works. Surface waters will be managed, allowing water to percolate naturally to ground.

Particular emphasis will also be placed on hazardous materials entering the surface water management system as well as spills or leaks of fuel oils. Section 4 provides an Emergency Response Plan for dealing with spillages which may result in adverse environmental effects.

The excavation phase of the development has the potential to encounter sub-surface and ground water during the works. However, the Flood Risk Assessment (FRA) completed by Tobins Engineers reported that the site is well drained therefore the potential for the requirement to manage a large volume of groundwater as part of excavation dewatering is minimal. In the event of encountering groundwaters during excavation, it will be pumped from the excavation to temporary on-site drainage system prior to discharge overland through vegetation. This will ensure any suspended silt or sediment is captured through the use of a silt bag on the pump outlet and a series of silt traps as required prior to discharge.

In general, the site of the proposed development is well drained, with a gently sloping topography which is likely to reflect the direction of groundwater flow at the site. No watercourses are present on the development site, Small stream channels can be seen along the Roshill beach which emerges ~ 100m west of the western boundary of the site. It is likely that runoff from these streams is flowing along the field boundaries and discharging to the Galway Bay at this point.

It is proposed that the development will drain via gravity to 12 no. soakaways proposed on site. Water draining to soakaways will pass through silt traps and hydrocarbon interceptors prior to reaching each soakaway. No surface water from roofs or paved surfaces will be discharge from the site, other than via the soakaways to ground.

Water supply to the site will be via connection to the adjacent public (Irish Water) watermain.

The proposed on-site foul sewers will discharge by gravity to a pumping station to the northwest of the site, and the foul waste will discharge from this pumping station via pumped rising main to the adjacent public (Irish Water) foul sewer network.

3.2 Cement Based Products Control Measures

The complete washing out of concrete trucks will not be permitted at the site. Suppliers will be directed back to their own facility to complete the washout process. However, a washout area for chute cleaning will be provided at various locations in close proximity to the concrete pour locations.

The following mitigation measures are proposed to avoid release of cement leachate from the site:

- No batching of wet-cement products will occur on site;
- Ready-mixed supply of wet concrete products and where possible, emplacement of pre-cast elements, will take place. Where possible pre-cast elements for culverts and concrete works will be used;
- No washing out of any plant used in concrete transport or concreting operations will be allowed on-site;

- Where concrete is delivered on site, only chute cleaning will be permitted, 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.
- Use weather forecasting 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;

3.3 Refuelling, Fuel and Hazardous Materials Storage

The following measures are proposed to avoid release of hydrocarbons at the site:

- Minimal refuelling or maintenance of construction vehicles or plant will take place on site. Off-site refuelling should occur at a controlled fuelling station;
- On-site refuelling will take place by direct refuelling from the delivery truck or using a mobile double skinned fuel bowser. The fuel bowser, a double-axel custom-built refuelling trailer will be re-filled off site and will be towed around the site as required. The fuel bowser will be parked on a level area in the construction compound when not in use. Only designated trained and competent operatives will be authorised to refuel plant on site. Mobile measures such as drip trays and fuel absorbent mats will be used during all refuelling operations.
- Fuels volumes stored on site should be minimised. Any fuel storage areas will be bunded appropriately for the volume of fuel stored. volume for the time period of the construction. The bunded area will be roofed to prevent the ingress of rainwater;
- The plant used should be regularly inspected for leaks and fitness for purpose; and,
- Spill kits will be available to deal with and accidental spillage in and outside the refuelling area. Spill control measures are outlined in the section that follows.

3.4 Spill Control Measures

It is not proposed to store any large volumes of oils/fuels for the purpose of refuelling on the site. A bunded fuel tank will be stored at the temporary construction compound which will be used for smaller plant and equipment i.e. site dumpers and teleporters. This will be stored on an impermeable surface and will be equipped with spill kit. Onsite plant (excavator) will be refuelled by an external contractor who will call to site as required. Road vehicles will not be refuelled at the site.

In the event of minor spills and leaks from road vehicles and the onsite excavator the following steps provide the procedure to be followed in the event of any significant spill or leak.

- Stop the source of the spill and raise the alarm to alert people working in the vicinity of any potential dangers.
- If applicable, eliminate any sources of ignition in the immediate vicinity of the incident
- Contain the spill using the spill control materials, track mats or other material as required. Do not spread or flush away the spill.
- If possible, cover or bund off any vulnerable areas where appropriate such as drains or watercourses.
- If possible, clean up as much as possible using the spill control materials.
- Contain any used spill control material and dispose of used materials appropriately using a fully licensed waste contractor with the appropriate permits so that further contamination is limited.
- Notify the applicant immediately giving information on the location, type and extent of the spill so that they can take appropriate action and further investigate the incident to ensure it has been contained adequately.
- External consultants will inspect the site and ensure the necessary measures are in place to contain and clean up the spill and prevent further spillage from occurring.
- The applicant will notify the appropriate regulatory body such as Galway Council if deemed necessary

3.5 Dust Control

Construction dust can be generated from many on-site activities such as excavation and backfilling. The extent of dust generation will depend on the type of activity undertaken, the location, the nature of the dust, *i.e.* soil, sand, etc and the weather. In addition, dust dispersion is influenced by external factors such as wind speed and direction and/or, periods of dry weather. Construction traffic movements also have the potential to generate dust as they travel along the haul route. The measures below will also prevent construction debris arising on the public road network.

Proposed measures to control dust include:

- Any site roads with the potential to give rise to dust will be regularly watered, as appropriate, during dry and/or windy conditions;
- The designated public roads outside the site and along the main transport routes to the site will be regularly inspected by Site Management for cleanliness, and cleaned as necessary;
- Material handling systems and material storage areas will be designed and laid out to minimise exposure to wind;
- Water misting or bowsers will operate on-site as required to mitigate dust in dry weather conditions;
- The transport of soils or other material, which has significant potential to generate dust, will be undertaken in tarpaulin-covered vehicles where necessary;
- All construction related traffic will have speed restrictions on un-surfaced roads to 15 kph;
- Daily inspection of construction sites to examine dust measures and their effectiveness.
- When necessary, sections of the haul route will be swept using a truck mounted vacuum sweeper; and,
- All vehicles leaving the construction areas of the site will pass through a wheel cleansing area prior to entering the local road network.

3.6 Noise & Vibration Control

The operation of plant and machinery, including construction vehicles, is a source of potential noise impacts During the works, any plant introduced to the site will not be excessively noisy. Exhaust and silencer systems on plant will be maintained in a satisfactory condition and operating correctly at all times. Defective silencers will be immediately replaced.

Proposed measures to control noise include:

- Diesel generators will be enclosed in sound proofed containers to minimise the potential for noise impacts;
- 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 on-site will be modern equipment and will comply with the European Communities (Construction Plant and Equipment) (Permissible Noise Levels) Regulations;
- Plant with the potential of generating noise or vibration will be placed as far away from sensitive properties as permitted by site constraints.
- Regular maintenance of plant will be carried out in order to minimise noise emissions. Particular attention will be paid to the lubrication of bearings and the integrity of silencers;
- All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the works;
- Compressors will be of the "sound reduced" models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers;
- Machines, which are used intermittently, will be shut down during those periods when they are not in use;

- Training will be provided by the Site Management to drivers to ensure smooth machinery operation/driving, and to minimise unnecessary noise generation; and,
- Local areas of the haul route will be condition monitored and maintained if necessary.

It is recommended that drivers of heavy goods vehicles (HGVs) associated with the development extend due care and courtesy to other road users. Excessive use of and unnecessary engine racing will be avoided.

The proposed construction working hours are as follows:

08:00 – 19:00 Monday to Friday

08:00 – 14:00 Saturday

Closed Sunday

3.7 Invasive Species Management

A baseline invasive species survey will be carried out at the site to identify the presence and location of any invasive species (listed under the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations, 2011 (S.I. 477 of 2011) by a suitably qualified ecologist prior to the commencement of construction. The non-native invasive species, Spanish Bluebell (*Hyacinthoides hispanica)* was recorded growing at one location close to the southern boundary of the development site. The following specific mitigation measures for Spanish bluebell are as follows:

- All construction staff will be briefed on the identification of invasive species including Spanish bluebell and made aware of the location of Spanish bluebell.
- All machinery, materials and topsoil will be verified as being clean of invasive species in advance on entering the site.
- Where disturbance of the species is unavoidable the following measures will be taken for the removal of Spanish bluebell from the development site:
    - Plants will be dug up after they have flowered with their leaves intact;
    - Plants will be left to dry until the bulbs are completely dead;
    - Once bulbs are completely dead, the material can be composted

3.8 Traffic Management Proposals

3.8.1 Construction Traffic Access and Management

During construction, the appointed contractor will be required to prepare a Construction Traffic Management Plan.

Below is a list of the proposed traffic management measures to be adopted during the construction works. Please note that this is not an exhaustive list, and it will be the appointed contractor's responsibility to further develop the traffic management measures which will be set out within their Construction Phase Traffic Management Plan.

- Warning signs / Advanced warning signs will be installed at appropriate locations in advance of the construction access locations;
- Construction and delivery vehicles will be instructed to use only the approved and agreed means of access; and movement of construction vehicles will be restricted to these designated routes;
- Appropriate vehicles will be used to minimise environmental impacts from transporting construction material, for example the use of dust covers on HGVs carrying dust producing material;

- Speed limits of construction vehicles to be managed by appropriate signage, to promote low vehicular speeds;
- No vehicle will be allowed to stop or park on the access road to the proposed development site.
- Ample parking will be provided within the site to cater for the staff and visitors during the construction phases of the proposed development.
- On site wheel washing will be undertaken for construction vehicles to remove any debris prior to leaving the site, to remove any potential debris on the local roads if it is deemed necessary;
- All vehicles will be suitably serviced and maintained to avoid any leaks or spillage of oil, petrol or diesel. All scheduled maintenance will not be carried out on the public highway; and
- A detailed haulage plan will be put in place to ensure minimal impact on the surrounding road network

3.9 Environmental Management Implementation

The Site Supervisor/Construction Manager will have overall responsibility for the organisation and execution of the construction phase of the development in accordance with the provisions of this CEMP. A series of daily checks of all works and the implementation of the mitigation measures set out throughout this document will be maintained. The findings of these daily checks will be documented by the site manager and will inform the overall site audit and inspection procedure as set out in Section 4.

3.10 Construction & Demolition Waste Management Plan

This section of the CEMP provides a Construction and Demolition Waste Management Plan (CDWMP) which outlines the best practice procedures during the demolition of the existing building on site and the construction phase of the project. The CDWMP will outline the methods of waste prevention and minimisation by recycling, recovery and reuse at each stage. Disposal of waste will be seen as a last resort.

3.10.1 Legislation

The Waste Management Act 1996 and its subsequent amendments provide for measures to improve performance in relation to waste management, recycling and recovery. The Act also provides a regulatory framework for meeting higher environmental standards set out by other national and EU legislation.

The Act requires that any waste related activity has to have all necessary licenses and authorisations. It will be the duty of the Waste Manager on the site of the proposed development to ensure that all contractors hired to remove waste from the site have valid Waste Collection Permits. It will then be necessary to ensure that the waste is delivered to a licensed or permitted waste facility. The hired waste contractors and subsequent receiving facilities must adhere to the conditions set out in their respective permits and authorisations.

The Department of the Environment provides a document entitled, 'Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects.

3.10.2 Preliminary Plan

The Department of the Environment guidelines state that, at the design stage of the project, only a preliminary WMP is required,

> *"Formal production and presentation of the Plan may be at a later stage but a clear 'waste management philosophy' needs to be adopted...at the initial conceptual stage of the Project..."*

This preliminary WMP has a number of key objectives as outlined below:

- To set out management prescriptions that adhere to a waste management hierarchy
- To outline the roles and responsibilities of the Waste Manager
- Prevention and minimisation of waste at the construction stage of the proposed development.

3.10.3 Waste Management Hierarchy

The waste management hierarchy sets out the most efficient way of managing waste in the following order:

Prevention and Minimisation:

The primary aim of the WMP will be to prevent and thereby reduce the amount of waste generated at each stage of the project. The prevention and minimisation of waste of this development will be developed by implementing effective on-site materials management in terms of both material acquisition and storage on site.

Reuse of Waste:

Reusing as much of the waste generated on site as possible will reduce the quantities of waste that will have to be transported off site to recovery facilities or landfill. Site management will be required to encourage the appropriate reuse of materials where possible as well as identify re-use opportunities to achieve ultimate goal of waste reduction.

Recycling of Waste:

There are a number of established markets available for the beneficial use of construction waste such as using waste concrete as fill for new roads. A designated Waste Storage Area (WSA) will be maintained on site which will cater for segregation and recycling of various waste streams.

At all times during the implementation of the WMP, disposal of waste to landfill will be considered only as a last resort.

3.10.4 Demolition Waste Management

The demolition phase of the proposed development will involve the removal of two stone ruins and an existing agricultural storage area from within the site.

Prior to the commencement of any demolition, excavation or construction works at the site works at the site a full audit of waste that will be generated on site will be carried out. For the purposes of this CEMP a list of expected waste types that may be generated has been drawn up and the European Waste Catalogue Codes pertaining to each waste type is included in Table 3.1. The lists have been prepared following a visit to the proposed development site and inspection of the existing buildings but do not constitute a full waste audit.

Table 3-1 Expected waste types arising from the Demolition Phase

Materials Type	Example	EWC Code
Soil & Stones	Overburden, soil, subsoil	17 05 04
Concrete	Surfacing, flooring material	17 01 01
Mixture of inert material	Sand, stones, plaster, rock	17 01 07
Metals	Disused Agricultural Fencing	17 04 07

3.10.4.1 Waste Arising from Demolition Activities

The majority of the waste generated by the demolition phase will consist of concrete rubble from the silage storage area and stones from the existing wall structures of the ruins. The remaining volume of waste material will be segregated according to type into individual skips pending removal by authorised waste collection contractors. The actual waste categories that will be subject to segregation during the demolition phase will be determined by the expected volumes of specific waste categories which will be assessed by the Waste Manager prior to any demolition works. Where a category of waste forms a smaller quantity, this will be disposed of in a general waste skip along with other categories of waste the volume of which does not warrant individual segregation This general waste material will be transferred to a Materials Recovery Facility (MRF) by a fully licensed waste contractor where the waste will be further sorted into individual waste streams for recycling, recovery or disposal. It is anticipated that the majority of materials will be re-used at the site for landscaping and site restoration purposes.

3.10.5 Excavation Waste Management Plan

The excavation phase of the proposed development will require the removal and management of the materials from the foundation excavations. It is anticipated that some of the material will be re-used on site for landscaping, backfilling and general restoration of excavated areas.

All excavated material which is not required for future landscaping works or for backfill of excavations will be removed to an authorised waste recovery facility. This will also apply to material which is not suitable for reuse on site.

3.10.6 Construction Phase Waste Management Plan

The first significant quantity of waste to be generated during the construction phase of the project will be the excavation for the associated foundations. This will generate a significant quantity of soil and subsoil material as a result of the excavation. Although a quantity of this material will be used for landscaping, backfilling and general restoration of excavated areas, it is anticipated that a quantity of this material will be exported off site by a licenced haulier to an authorised waste facility.

Waste generated post excavation on site will be managed in the WSA where the various waste components will be segregated into a number of waste categories in accordance with a general waste segregation policy and placed into individual skips. The categories for segregation will include, timber, metal, cardboard and plastics. This material will be removed by authorised waste collection contractors for recycling and recovery at various licensed facilities. The remaining volume of waste material which cannot be allocated to any of these four waste streams will be disposed of in a general waste skip. This waste material will be transferred to a Materials Recovery Facility by a fully licensed waste contractor where the waste will be further sorted into individual waste streams for recycling, recovery or disposal. This general waste will be subject to constant monitoring by site management to ensure that potential reusable and recyclable material is not being disposed of therein. The on-site canteen will include waste receptacles for dry recyclables and food waste which should eliminate the potential of any waste produced within the canteen being sent to landfill. The expected wastes arising from the works including the individual European Waste Catalogue (EWC) codes are outlined in Table 3.2.

Table 3-2 Expected waste types arising during the construction phase

Materials type	Example	EWC Code
Cables	Electrical wiring	17 04 11
Concrete	Surfacing, flooring material	17 01 01
Insulation	Cavity & Floor Insulation	17 06 04

Materials type	Example	EWC Code
Tiles and ceramics	Wall and floor tiles	17 02 03
Bituminous materials	Torch on felt roof coverings	17 03 01
Metals	Rebar, reinforced steel joists, lead	17 04 07
Mixture of inert material	Sand, stones, plaster, rock	17 01 07
Plastic	PVC frames, electrical fittings	17 02 03
Soil & Stones	Overburden, soil, subsoil	17 05 04
Gypsum materials	Roof tiles/slabs	17 08 02
Wood	Frames and doors,	17 02 01
Canteen Waste	Miscellaneous waste from site staff	20 01 08

The potential for re-use of materials on the site during the works will be minimal however clean inert concrete, rubble and stones may have a re-use potential for landscaping and site restoration. However, considering the major excavation works on the site have been completed, the quantity of such material being generated will be minimal and is likely to be reused locally.

3.10.7 Waste Arisings and Proposals for Minimisation, Reuse and Recycling of Construction Waste

Construction waste will arise on the project mainly from excavation and unavoidable construction waste including material surpluses and damaged materials and packaging waste.

Appropriate measures should be taken to ensure excess waste is not generated during construction, including;

- Ordering of materials should be on an 'as needed' basis to prevent over supply to site. Co-ordination is required with suppliers enabling them to take/buy back surplus stock.
- Purchase of materials pre-cut to length to avoid excess scrap waste generated on site.
- Request that suppliers use least amount of packaging possible on materials delivered to the site.
- Ensuring correct storage and handling of goods to avoid unnecessary damage that would result in their disposal
- Ensuring correct sequencing of operations.
- Use reclaimed materials in the construction works.

Hazardous waste will be kept separate from all other construction waste to prevent contamination and removed appropriately.

3.10.8 Waste Arising from Construction Activities

The expected waste volumes generated on site are unlikely to be large enough to warrant source segregation or a dedicated waste storage area. Wastes will generally comprise soils and subsoils which will be removed by truck to an authorised waste recovery facility.

3.10.9 Reuse

Many construction materials can be reused a number of times before they have to be disposed of:

- Concrete can be reused as aggregate for roads cable trench backfilling material.
- Plastic packaging etc. can be used to cover materials on site or reused for the delivery of other materials.

3.10.10 Recycling

If a certain type of construction material cannot be reused on site then recycling is the most suitable option.

All waste that is produced during the construction phase including dry recyclables will be sent directly for subsequent segregation at a remote facility. The low volume of such material that is anticipated to be generated at the proposed development is the justification for adopting this method of waste management.

3.10.11 Wastewater

The removal and disposal of wastewater from site welfare facilities, will be carried out by a fully permitted waste collector holding valid Waste Collection Permits as issued under the Waste Management (Collection Permit) Regulations, 2007. Information on the appointed permitted contractor and evidence of a maintenance contract having been submitted to the Planning Authority prior to any construction works taking place.

3.10.12 Implementation

3.10.12.1 Roles and Responsibilities for Waste Management

Prior to the commencement of the proposed development a Waste Manager will be appointed by the project team. The role of Waste Manager is likely to be fulfilled by the Site Manager given the scale of the development and will be responsible for the implementation of the objectives of this plan, ensuring that all hired waste contractors have the necessary authorisations and that the waste management hierarchy is adhered to. The person nominated must have sufficient authority so that they can ensure everyone working on the proposed development adheres to the management plan. The waste manager will also be required to conducted regular waste audits in the WSA and throughout the site to ensure that the waste management plan is operating effectively.

3.10.12.2 Training

It is important for the Construction Waste Manager to communicate effectively with colleagues in relation to the aims and objectives of the WMP. All employees working on site during the construction phases of the project will be trained in materials management and thereby, should be able to:

- Distinguish reusable materials from those suitable for recycling;
- Ensure maximum segregation at source;
- Co-operate with site manager on the best locations for stockpiling reusable materials;
- Separate materials for recovery; and
- Identify and liaise with waste contractors and waste facility operators.

3.10.12.3 Record Keeping

The WMP will provide systems that will enable all arisings, movements and treatments of construction waste to be recorded. This system will enable the contractor to measure and record the quantity of waste being

generated. It will highlight the areas from which most waste occurs and allows the measurement of arisings against performance targets. The WMP can then be adapted with changes that are seen through record keeping.

The fully licensed waste contractor employed to remove waste from the site will be required to provide documented records for all waste dispatches leaving the site of the proposed development. Each record will contain the following:

- Consignment Reference Number
- Material Type(s) and EWC Code(s)
- Company Name and Address of Site of Origin
- Trade Name and Collection Permit Ref. of Waste Carrier
- Trade Name and Licence Ref. of Destination Facility
- Date and Time of Waste Dispatch
- Registration no. of Waste Carrier vehicle
- Weight of Material
- Signature of Confirmation of Dispatch detail
- Date and Time of Waste Arrival at Destination
- Weight of Material
- Site Address of Destination Facility

3.10.13 Waste Management Plan Conclusion

The WMP will be properly adhered to by all staff involved in the project which will be outlined within the induction process for all site personnel. The waste hierarchy should always be employed when designing the plan to ensure that the least possible amount of waste is produced during the construction phase. Reuse of certain types of construction wastes will cut down on the cost and requirement of raw materials therefore further minimising waste levels.

This preliminary WMP has been prepared to outline the main objectives that are to be adhered to for the preparation of a more detailed WMP to be completed after the planning phase of the proposed development.

4. ENVIRONMENTAL MANAGEMENT IMPLEMENTATION

4.1 Construction Manager/Site Supervisor

The Construction Manager/Site Supervisor will have overall responsibility for the organisation and execution of all related environmental activities as appropriate, in accordance with regulatory and project environmental requirements. The duties and responsibilities of the Site Supervisor/Construction Manager will include:

- Ensure that all works are completed safely and with minimal environmental risk;
- Approve and implement the CEMP and supporting environmental documentation, and ensure that all environmental standards are achieved during the construction phase of the project;
- Take advice from the Site Environmental Manager on legislation, codes of practice, guidance notes and good environmental working practice relevant to their work;
- Ensure compliance through audits and management site visits;
- Ensure timely notification of environmental incidents; and,
- Ensure that all construction activities are planned and performed such that minimal risk to the environment is introduced.

4.2 Environmental Manager

The main contractor appointed to carry out the works on site will be required to provide a level of supervision on site in the form of an Environmental Manager who will also fulfil the role of Waste Manager. Due to the scale of activity proposed for the site, this role can be adopted by a Site Manager/Foreman as part of their duties. In general, this Environmental Manager will maintain responsibility for monitoring the works and Contractors/Sub-contractors from an environmental perspective. The Environmental Manager will act as the regulatory interface on environmental matters by reporting directly to the client and liaising with Galway City Council and other statutory bodies as required. The Site Environmental Manager will report to the Site Supervisor/Construction Manager. The duties of the appointed Environmental Manager are summarised as follows:

- Maintain and update as required the Construction Phase CEMP and supporting environmental documentation and review/approval of contractor method statements;
- Undertake inspections and reviews to ensure the works are carried out in compliance with the CEMP;
- Monitor the implementation of the CEMP, particularly all proposed/required Environmental Monitoring;
- Generate environmental reports as required to show environmental data trends and incidents and ensure environmental records are maintained throughout the construction period;
- Advise site management/contractor/sub-contractors on:
    - Prevention of environmental pollution and improvement to existing working methods;
    - Changes in legislation and legal requirements affecting the environment;
    - Suitability and use of plant, equipment and materials to prevent pollution;
    - Environmentally sound methods of working and systems to identify environmental hazards;
- Ensure proper mitigation measures are initiated and adhered to during the construction phase;
- Liaise with Project Team and present the findings of site audits/inspections that are completed;
- Ensure adequate arrangements are in place for site personnel to identify potential environmental incidents;

- Ensure that details of environmental incidents are communicated in a timely manner to the relevant regulatory authorities, initially by phone and followed up as soon as is practicable by email;
- Support the investigation of incidents of significant, potential or actual environmental damage, and ensure corrective actions are carried out, recommend means to prevent recurrence and communicate incident findings to relevant parties;
- Identify environmental training requirements and arrange relevant training for all levels of site-based staff/workers; and
- Fulfil the role of Waste Manager and implement the objectives of the Waste Management Plan as set out in Section 3 above.
- Coordinate the Emergency Response in terms of site health and safety and environmental protection as outlined in the section below

4.3 Emergency Response

The Emergency Response Plan (ERP) is presented in this section of the CEMP. It provides details of procedures to be adopted in the event of an emergency in terms of site health and safety and environmental protection. The site ERP includes details on the response required and the responsibilities of all personnel in the event of an emergency. The ERP will require updating and submissions from the contractor/PSCS and suppliers as the proposed project progresses. Where sub-contractors that are contracted on site are governed by their own emergency response procedure a bridging arrangement will be adopted to allow for inclusion of the sub-contractor's ERP within this document.

This is a working document that requires updating throughout the various stages of the project.

4.3.1 Roles and Responsibilities

The chain of command during an emergency response sets out who is responsible for coordinating the response. The Site Manager will lead the emergency response which makes him responsible for activating and coordinating the emergency response procedure. The other site personnel who can be identified at this time who will be delegated responsibilities during the emergency response are presented in Figure 4.1. In a situation where the Site Manager is unavailable or incapable of coordinating the emergency response, the responsibility will be transferred to the next person in the chain of command outlined in Figure 4.1. This will be updated throughout the various stages of the project.

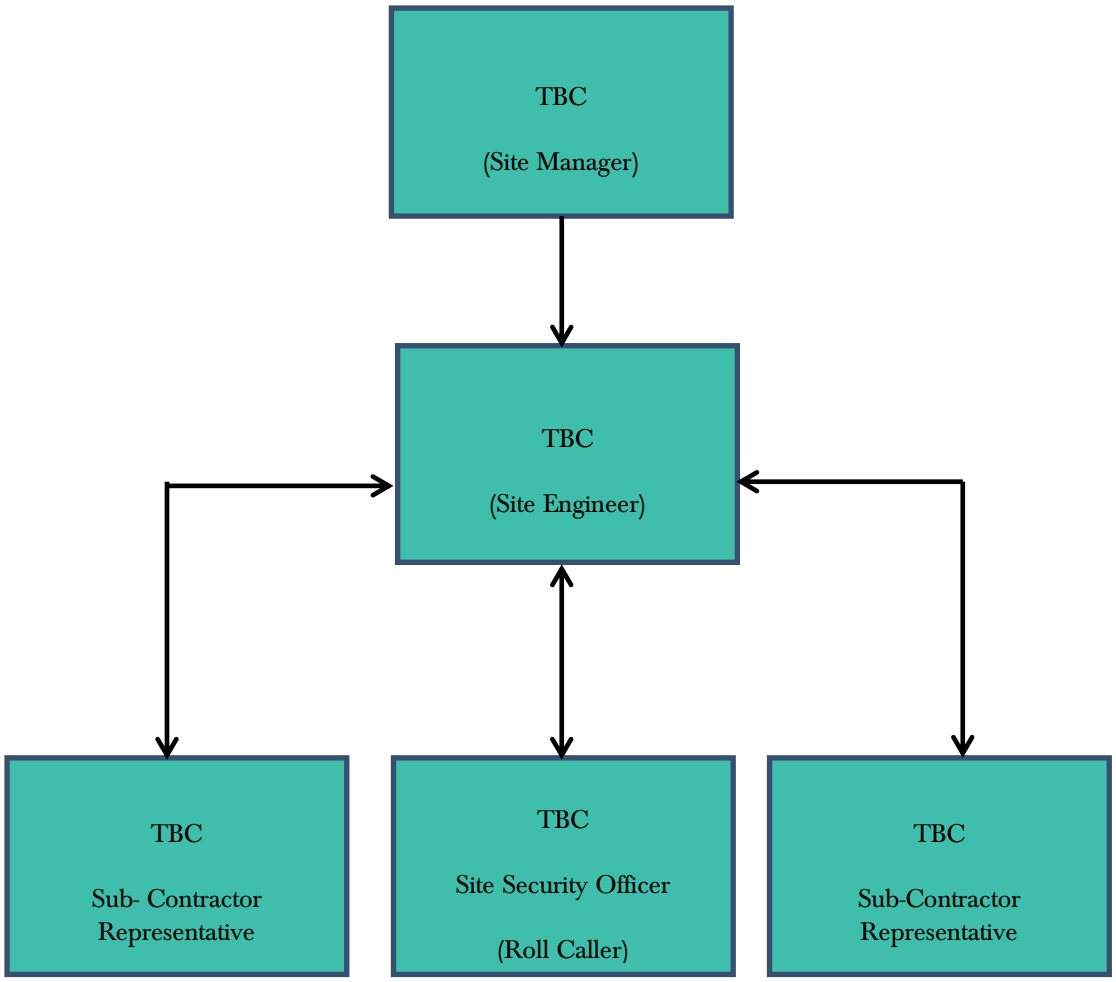


Figure 4-1 Emergency Response Procedure Chain of Command

4.3.2 Initial Steps

In order to establish the type and scale of potential emergencies that may occur, the following hazards have been identified as being potential situations that may require an emergency response in the event of an occurrence.

Table 4-1 Hazards associated with potential emergency situations

Hazard	Emergency Situation
Construction Vehicles: Dump trucks, tractors, excavators, cranes etc.	Collision or overturn which has resulted in operator or third-party injury.
Abrasive wheels/Portable Tools.	Entanglement, amputation or electrical shock associated with portable tools.
Contact with services.	Electrical shock or gas leak associated with an accidental breach of underground services.
Fire	Injury to operative through exposure to fire.
Sickness	Illness unrelated to site activities of an operative e.g. heart attack, loss of consciousness, seizure.

In the event of an emergency situation associated with, but not restricted to, the hazards outlined in Table 4.1 the Site Manager will carry out the following:

- Establish the scale of the emergency situation and identify the number of personnel, if any, have been injured or are at risk of injury.
- Where necessary, sound the emergency siren/fog horn that activates an emergency evacuation on the site.
- Make safe the area if possible and ensure that there no identifiable risk exists with regard to dealing with the situation e.g. if a machine has turned over, ensure that it is in a safe position so as not to endanger others before assisting the injured.
- Contact the required emergency services or delegate the task to someone if he is unable to do so. If delegating the task, ensure that they follow the procedures for contacting the emergency services as set out in Section 4.4.
- Take any further steps that are deemed necessary to make safe or contain the emergency incident e.g. cordon off an area where an incident associated with electrical issues has occurred.
- Contact any regulatory body or service provider as required e.g. ESB Networks the numbers for which as provided in Section 4.4.2.
- Contact the next of kin of any injured personnel where appropriate. The procedure for this is outlined in Section 4.4.3.

4.3.3 Spill Control Measures

Every effort will be made to prevent an environmental incident during the construction and operational phase of the proposed project. Oil/Fuel spillages are one of the main environmental risks that will exist on the proposed site which will require an emergency response procedure. The importance of a swift and effective response in the event of such an incident occurring cannot be over emphasised. The following steps provide the procedure to be followed in the event of such an incident.

- Stop the source of the spill and raise the alarm to alert people working in the vicinity of any potential dangers.
- If applicable, eliminate any sources of ignition in the immediate vicinity of the incident
- Contain the spill using the spill control materials, track mats or other material as required. Do not spread or flush away the spill.
- If possible, cover or bund off any vulnerable areas where appropriate such as drains, watercourses or sensitive habitats.
- If possible, clean up as much as possible using the spill control materials.
- Contain any used spill control material and dispose of used materials appropriately using a fully licensed waste contractor with the appropriate permits so that further contamination is limited.
- Notify the Environmental Manager immediately giving information on the location, type and extent of the spill so that they can take appropriate action.
- The Environmental Manager will inspect the site and ensure the necessary measures are in place to contain and clean up the spill and prevent further spillage from occurring.
- The Environmental Manager will notify the appropriate regulatory body such as Galway City Council, The Department of Communications, Climate Action and Environment and the Department of Housing, Planning and Local Government , if deemed necessary.

Environmental incidents are not limited to just fuel spillages. Therefore, any environmental incident must be investigated in accordance with the following steps.

- The Environmental Manager must be immediately notified.

- If necessary, the Environmental Manager will inform the appropriate regulatory authority. The appropriate regulatory authority will depend on the nature of the incident.
- The details of the incident will be recorded on an Environmental Incident Form which will provide information such as the cause, extent, actions and remedial measures used to follow the incident. The form will also include any recommendations made to avoid reoccurrence of the incident.
- If the incident has impacted on an ecologically sensitive receptor, such as a sensitive habitat, protected species or designated conservation site (pSPA or cSAC), the Environmental Manager will liaise with a Project Ecologist.
- If the incident has impacted on a sensitive receptor such as an archaeological feature the Environmental Manager will liaise with a Project Archaeologist.
- A record of all environmental incidents will be kept on file by the Environmental Manager and the Main Contractor. These records will be made available to the relevant authorities such as Galway City Council, DCCAE and DHPLG if required.

The Environmental Manager will be responsible for any corrective actions required as a result of the incident e.g. an investigative report, formulation of alternative construction methods or environmental sampling, and will advise the Main Contractor as appropriate.

4.4 Contacting the Emergency Services

4.4.1 Emergency Communications Procedure

In the event of requiring the assistance of the emergency services the following steps should be taken:

Stay calm. It's important to take a deep breath and not get excited. Any situation that requires 999/112 is, by definition, an emergency. The dispatcher or call-taker knows that and will try to move things along quickly, but under control.

Know the location of the emergency and the number you are calling from. This may be asked and answered a couple of times but don't get frustrated. Even though many emergency call centres have enhanced capabilities meaning they are able to see your location on the computer screen they are still required to confirm the information. If for some reason you are disconnected, at least emergency crews will know where to go and how to call you back.

Wait for the call-taker to ask questions, then answer clearly and calmly. If you are in danger of assault, the dispatcher or call-taker will still need you to answer quietly, mostly "yes" and "no" questions.

If you reach a recording, listen to what it says. If the recording says your call cannot be completed, hang up and try again. If the recording says all call takers are busy, WAIT. When the next call-taker or dispatcher is available to take the call, it will transfer you.

Let the call-taker guide the conversation. He or she is typing the information into a computer and may seem to be taking forever. There's a good chance, however, that emergency services are already being sent while you are still on the line.

Follow all directions. In some cases, the call-taker will give you directions. Listen carefully, follow each step exactly, and ask for clarification if you don't understand.

Keep your eyes open. You may be asked to describe victims, suspects, vehicles, or other parts of the scene.

Do not hang up the call until directed to do so by the call taker.

4.4.2 Contact Details

A list of emergency contacts is presented in Table 4.2. A copy of these contacts will be included in the Site Safety Manual and in the site offices and the various site welfare facilities

Table 4-2 Emergency Contacts

Contact	Telephone no.
Emergency Services – Ambulance, Fire, Gardaí	999/112
Doctor – Roscam Medical Centre	091 779 860
Hospital –University Hospital Galway	091 524 222
ESB Emergency Services	1850 372 999
Gas Networks Ireland	1850 20 50 50
Gardaí – Oranmore Garda Station	091 388 030
Health and Safety Coordinator - Health & Safety Services	TBC
Health and Safety Authority	1890 289 389
Project Supervisor Construction Stage (PSCS): TBC	TBC
Project Supervisor Design Stage (PSDS): TBC	TBC
Client – Kegata Ltd.	TBC

4.4.3 Procedure for Personnel Tracking

All operatives on site without any exception will have to undergo a site induction where they will be required to provide personal contact details which will include contact information for the next of kin.

In the event of a site operative becoming involved in an emergency situation where serious injury has occurred, and hospitalisation has taken place, it will be the responsibility of the Site Manager or next in command if unavailable to contact the next of kin to inform them of the situation that exists.

4.4.4 Induction Checklist

Table 4.3 provides a list of items highlighted in this ERP which must be included or obtained during the mandatory site induction of all personnel that will work on the site. This will be updated throughout the various stages of the project.

Table 4-3 Emergency Response Plan Items Applicable to the Site Induction process

ERP Items to be included in Site Induction	Status
All personnel will be made aware of the evacuation procedure during site induction.	
Due to the location of the site it may be necessary to liaise with and assist the emergency services on the ground in terms of locating the site. This may involve providing an escort from a designated meeting point that may be located more easily by the emergency services. This should form part of the site induction to make new personnel and sub-contractors aware of any such arrangement or requirement if applicable.	
All operatives on site without any exception will have undergo a site induction where they will be required to provide personal contact details which will include contact information for the next of kin.	

5. MITIGATION PROPOSALS

The Mitigation Measures are presented in the following pages. Any conditions attached to a grant of planning permission will be incorporated into the audit list including an addition or regulatory amendment or standard changes prior to or during construction.

By presenting the mitigation proposals in the below format, it is intended to provide an easy to audit list that can be reviewed and reported on during the future phases of the project. The tabular format in which the below information is presented, can be further expanded upon during the course of future project phases to provide a reporting template for site compliance audits.

Table 4-4 Mitigation Measures

Mitigation Measure	Reference	Mitigation Measure	Audit Result	Action Required
Pre-Commencement Phase				
1	CEMP Section 2,	All site activities will be provided for in a Construction Environmental Management Plan, prepared prior to the commencement of any operations onsite. The CEMP will set out all measures to be adhered to during the pre-commencement, construction and operational phases of the proposed development.		
2	CEMP Section 4	The main contractor will be required to engage a Construction Manager that will also fulfil the role of Environmental Manager (EM), and to monitor all site works and to ensure that methodologies and mitigation are followed throughout construction to avoid negatively impacting on the receiving environment.		
Construction Phase				
Construction Management				
3	CEMP Section 3	Ready-mixed supply of wet concrete products and where possible, emplacement of pre-cast elements, will take place. No batching of wet-cement products will occur on site.		
4	CEMP Section 3	No washing out of any plant used in concrete transport or concreting operations will be allowed on-site;		
Fuel and Oil Control				
5	CEMP Section 3	› All plant and machinery will be serviced before being mobilised to site. › No refueling of machinery or overnight parking of machinery is permitted in areas adjacent to watercourses or on-site drainage infrastructure. › On-site refueling will only take place at distances greater than 50 metres from nearest water courses or site drainage infrastructure.		

		› On-site refueling of machinery will be carried out using an oil company vehicle sourced from a local supplier. Only dedicated trained and competent personnel will carry out refueling operations. A spill kit and drip tray shall be on site at all times and available for all refueling operations. Equipment shall not be left unattended during refueling. › Spill kits shall be available in each item of plant required. › Care will be taken at all times to avoid contamination of the environment with contaminants other than hydrocarbons, such as uncured concrete or other chemicals. The plant refuelling procedures described above shall be detailed in the contractor's method statements.		
Surface Water Mitigation				
6	CEMP Section 3, EIAR Chapter 7	› Works shall not take place at periods of high rainfall, and shall be scaled back or suspended if heavy rain is forecast; › Machinery deliveries shall be arranged using existing structures along the existing road; › Any excess construction material shall be immediately removed from the area and sent to an authorized waste recovery facility; › Spill kits shall be available in each item of plant required; › 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; › Prior to the commencement of earthwork silt fencing will be placed down-gradient of the construction areas where drains or drainage pathways are present		
Air Quality and Dust Control				
7	CEMP Section 3	▪ The site track will be regularly inspected by site management for cleanliness and cleaned as necessary. ▪ The transport of crushed stone or other material, which has significant potential to cause dust, will be undertaken in tarpaulin-covered vehicles where necessary.		

		▪ When necessary, sections of approach roads to the site will be swept using a street cleaner and / or damped down with water.		
		Noise		
8	CEMP Section 3	▪ Diesel generators will be enclosed in sound proofed containers to minimise the potential for noise impacts. ▪ 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 on-site will be modern equipment and will comply with the European Communities (Construction Plant and Equipment) (Permissible Noise Levels) Regulations 1998, and any subsequent amendments. ▪ Regular maintenance of plant will be carried out in order to minimise noise emissions. ▪ All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the works. ▪ Compressors will be of the "sound reduced" models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers. ▪ Machines, which are used intermittently, will be shut down during those periods when they are not in use. ▪ Training will be provided by the site management to drivers to ensure smooth machinery operation/driving, and to minimise unnecessary noise generation.		
		Environmental Management		
9	NIS	▪ Access pathways through the woodland will be constructed using a minimalist intervention approach to ensure the preservation of woodland		

		trees. The path will be constructed using a non-dig method using a combination of timber sleepers, cellweb system and gravel to ensure increased access to the root protection areas of the trees occurs in a manner not detrimental to the trees. The pathway will be constructed in a meandering manner so as to avoid the felling of existing trees.		

6. COMPLIANCE AND REVIEW

6.1 Site Inspections and Environmental Audits

Routine inspections of activities will be carried out on a daily and weekly basis by the Site Environmental Manager/Construction Manager as appointed by the applicant to ensure all controls to prevent environmental impact, relevant to the construction activities taking place at the time, are in place.

Environmental inspections will ensure that the works are undertaken in compliance with this CEMP. Environmental site inspections will be carried out by suitably trained staff.

6.2 Environmental Compliance

The following definitions shall apply in relation to the classification of Environmental Occurrences during the infilling works:

Environmental Near Miss: An occurrence which if not controlled or due to its nature could lead to an Environmental Incident.

Environmental Incident: Any occurrence which has potential, due to its scale and nature, to migrate from source and have an environmental impact beyond the site boundary.

Environmental Non-Compliance: Non-fulfilment of a requirement and includes any deviations from established procedures, programs and other arrangements related to the CDMP.

6.3 Corrective Action Procedure

A corrective action is implemented to rectify an environmental issue on-site. Corrective actions will be implemented by the Construction Manager, as advised by the Site Environmental manager. Corrective actions may be required as a result of the following;

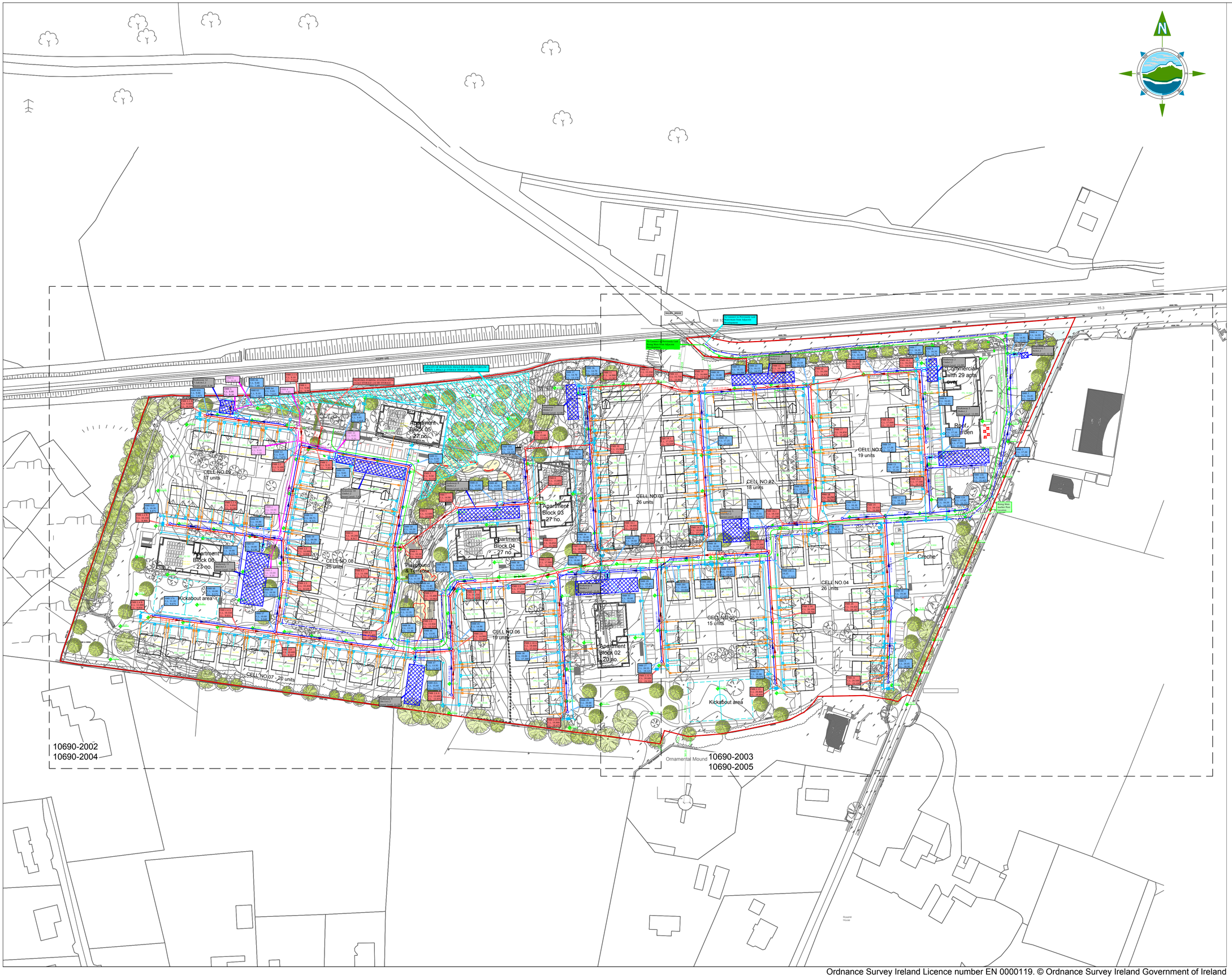
- Environmental Audits;
- Environmental Inspections and Reviews;
- Environmental Incidents; and,
- Environmental Complaints.

A Corrective Action Notice will be used to communicate the details of the action required to the main contractor. A Corrective Action Notice is a form that describes the cause and effect of an environmental problem on site and the recommended corrective action that is required. The Corrective Action Notice, when completed, will include details of close out and follow up actions.

If an environmental problem occurs on site that requires immediate attention direct communications between the Construction Manager and the Site Environmental manager will be conducted. This in turn will be passed down to the site staff involved. A Corrective Action Notice will be completed at a later date.

APPENDIX 1

SITE DRAINAGE PLAN



LEGEND

- Site Boundary
- Proposed Ø 150mm HDPE Rising Main
- Proposed Foul Sewer and Manhole
- Proposed Inspection Chamber and Connection
- Proposed Storm Sewer and Manhole
- Proposed Soakpit
- Proposed Overflow Network and Manhole
- Proposed Storm overflow Retention Swale
- Proposed Petrol Interceptor
- Proposed Level
- Finished Floor Level
- Proposed Ø 200mm PE100 SDR 17 Water Supply Pipe
- Proposed Ø 150mm PE100 SDR 17 Water Supply Pipe
- Proposed Ø 25/32mm PE80 SDR 17 House Connection and Water Meter
- Proposed Sluice Valve
- Proposed Fire Hydrant
- Proposed Bulk Meter
- Proposed Air Valve
- Proposed Scour Valve Chamber
- Proposed Thrust Block
- Proposed Wash Out Hydrant

NOTES:

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING.
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
3. ENGINEER/EMPLOYERS REPRESENTATIVE, AS APPROPRIATE, TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
4. THE CONTRACTOR SHALL UNDERTAKE A THOROUGH CHECK FOR THE ACTUAL LOCATION OF ALL SERVICES/UTILITIES, ABOVE AND BELOW GROUND, BEFORE ANY WORK COMMENCES
5. ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Rev	Date	Description	By	Chkd.
F	03/12/19	Revised after IW Comments	RD	BH
E	02/12/19	Revised after IW Comments	RD	BH
D	02.12.2019	Minor Revisions to Layout IW Comments Addressed	RD	BH
C	05.11.2019	Revised Architect Layout	JK	RD
B	17.07.19	New Backgorund	FG	RD
A	10.07.19	First Issue	JK	BH

Client: Kegata Ltd

Project: Residential Development at Roshill Galway

Title: Proposed Drainage and Watermain Layout Key Plan

Scale @ A1: 1:1000 A3: 1:2000

Prepared by:	Checked:	Date:
JK	BH	July 2019

Project Director: M. McD.

Drawing Status: Plannning

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Drawing No.: 10690-2001 Revision: F

Individual wastewater connection to each dwelling will be as per Standard Detail STD-WW-02.

The inspection chamber will be in compliance with STD-WW-03 and STD-WW-13 and will be located within 1m of each site boundary.

Pipe materials shall comply with section 3.13. of the Code of Practice.
Pipe materials will be Unplasticiesed PVC for the main sewers as per Section 3.13.3 of the Code of Practice.

Manholes will conform to standard details STD-WW-09, STD-WW-10, STD-WW-11 and / or STD-WW-12 as appropriate.

Separation distances from foul sewers to structures and other utilities will comply with Section 3.5 of the Code of Practice.

Refer to STD-W-12A, STD-WW-06, STD-WW-06A & 3.26 of the code of practice for Planting Restrictions of Water and Waste Water. Root protection to be ReRoot 2000 OR Similar, if re□uired

Refer to detail STD-W-11 for typical services layout distances & STD-WW-05 for wastewater typical services layout, and 3.21 Wastewater Code of Practice

Scour valve on an offline pipe to be agreed by local authority. See section 3.16.4 and 3.21 of the Water Code of Practice.
Connection to Stormwater

Refer to section 3.5.16 of the waste water code of practice for unavoidable services crossover

Manhole covers located in grass areas to have 200mm all round concrete plinth and 100mm deep formed C20/25 concrete, 20mm aggregate, bedded in Clause 804 material

Refer to 3.5.13 of the Code of Practice for staggered systems details

Refer to section 3.14 of the Waste Water Code of Practice for Rising Main pipe materials

External face of proposed manhole chamber to be a minimum of 0.5m from kerb line and external face of sewers are a minimum of 1m from kerb line. See section 3.5.15 of Wastewater Code of Practice

Invert level of existing storm and foul manholes
at connection point on the main road to be checked and confirmed prior to commencement of any works on site.

ALL WORKS WILL BE CARRIED OUT IN ACCORDANCE WITH THE IRISH WATER CODES OF PRACTICE AND IRISH WATER DETAILS

CAPACITY OF RETENTION SWALE FOR STORM OVERFLOW - APPROX 3,480m3 @ AVERAGE DEPTH OF 1.2M

PROPOSED PUMPING STATION WITH 212m3 STORAGE (24 HR STORAGE

Underground Pumping station location by engineers specification & design

SINGLE CONNECTION TO IRISH WATER INFRASTRUCTURE IN PUBLIC ROAD. INDIVIDUAL CONNECTIONS FROM APARTMENTS TO BE MANAGED BY MANAGEMENT COMPANY

SINGLE CONNECTION TO IRISH WATER INFRASTRUCTURE IN PUBLIC ROAD. INDIVIDUAL CONNECTIONS FROM APARTMENTS TO BE MANAGED BY MANAGEMENT COMPANY

SINGLE CONNECTION TO IRISH WATER INFRASTRUCTURE IN PUBLIC ROAD. INDIVIDUAL CONNECTIONS ROM APARTMENTS TO BE MANAGED BY MANAGEMENT COMPANY

Apartment Block 05 - 27 no.

Apartment Block 03 27 no.

Apartment Block 04 - 27 no.

Apartment Block 06 - 27 no.

Apartment Block 02 20 no.

CELL NO.09 17 units

CELL NO.08 25 units

CELL NO.07 - 20 units

CELL NO.06 19 units

Playground & Terraces

Kickabout area

Soakaway 12 7.5x8.0x1.2 Invert Level: 6.30
Soakaway 11 30x13x1.2 Invert Level: 7.00
Soakaway 10 33x8x1.2 Invert Level: 7.0
Soakaway 9 20x11x1.2 Invert Level: 11.18
Soakaway 8 29x9x1.2 Invert Level: 12.725
Soakaway 7 20x6x1.2 Invert Level: 12.00
Soakaway 6 36x8x1.2 Invert Level: 15.06

SMH 65A C.L. 9.00 I.L. 7.675
SMH 66 C.L. 9.00 I.L. 7.49
SMH 65 C.L. 9.10 I.L. 7.503
SMH 64 C.L. 9.05 I.L. 7.625
SMH 54 C.L. 9.05 I.L. 7.414
SMH 53 C.L. 9.10 I.L. 7.675
SMH 55 C.L. 9.05 I.L. 7.40
SMH 52 C.L. 09.75 I.L. 8.325
SMH 59 C.L. 09.90 I.L. 8.27
SMH 50 C.L. 10.20 I.L. 8.637
SMH 51 C.L. 9.50 I.L. 7.87
SMH 39A C.L. 15.55 I.L. 14.125
SMH 41 C.L. 15.95 I.L. 13.92
SMH 40 C.L. 15.95 I.L. 13.931
SMH 39 C.L. 16.20 I.L. 13.973
SMH 37 C.L. 14.70 I.L. 13.178
SMH 36 C.L. 14.70 I.L. 13.19
SMH 35 C.L. 16.30 I.L. 14.325
SMH 61A C.L. 10.30 I.L. 8.875
SMH 62 C.L. 10.00 I.L. 8.163
SMH 63 C.L. 10.00 I.L. 8.138
SMH 61 C.L. 10.00 I.L. 8.378
SMH 60 C.L. 10.00 I.L. 8.575
SMH 58 C.L. 10.50 I.L. 8.915
SMH 57A C.L. 11.10 I.L. 9.675
SMH 57 C.L. 10.60 I.L. 9.048
SMH 49 C.L. 11.10 I.L. 9.275
SMH 48 C.L. 12.35 I.L. 10.292
SMH 56 C.L. 13.33 I.L. 11.44
SMH 47 C.L. 13.95 I.L. 12.367
SMH 45A C.L. 15.60 I.L. 14.175
SMH 46 C.L. 13.95 I.L. 12.379
SMH 45 C.L. 14.90 I.L. 13.00
SMH 44 C.L. 15.40 I.L. 13.963
SMH 43 C.L. 16.25 I.L. 14.21
SMH 42 C.L. 16.35 I.L. 14.925
SMH 38 C.L. 16.85 I.L. 15.375
SMH 34 C.L. 18.00 I.L. 16.30
SMH 33 C.L. 18.60 I.L. 16.256
SMH 32 C.L. 18.60 I.L. 16.268
SMH 31 C.L. 18.00 I.L. 16.469
SMH 30 C.L. 19.00 I.L. 17.300
SMH 29 C.L. 20.00 I.L. 18.40
SMH 28 C.L. 19.45 I.L. 17.875
FMH 2.1 A C.L. 9.10 I.L. 7.315
FMH 2.1 B C.L. 9.400 I.L. 8.250
FMH 2.1 C.L. 9.100 I.L. 7.223
FMH 2 C.L. 9.25 I.L. 7.057
FMH 3 C.L. 9.50 I.L. 8.119
FMH 1 C.L. 9.00 I.L. 6.98
FMH 2.2 B C.L. 10.250 I.L. 8.900
FMH 2.2 A C.L. 9.850 I.L. 8.240
FMH 2.2 C.L. 10.000 I.L. 8.008
FMH 4 C.L. 10.200 I.L. 8.917
FMH 5 C.L. 10.20 I.L. 9.014
FMH 6 C.L. 12.600 I.L. 10.000
FMH 7 C.L. 14.90 I.L. 12.670
FMH 8 C.L. 15.800 I.L. 12.877
FMH 8.1 C.L. 16.850 I.L. 15.300
FMH 9 C.L. 15.00 I.L. 13.036
FMH 10 C.L. 15.900 I.L. 13.223
FMH 10.1 C.L. 18.000 I.L. 16.650
FMH 11 C.L. 14.900 I.L. 13.387
FMH 12 C.L. 15.550 I.L. 13.690
FMH 2.12 C.L. 19.400 I.L. 17.294
FMH 2.11 C.L. 18.500 I.L. 16.950
FMH 2.10 C.L. 17.900 I.L. 16.421
FMH 2.10 A C.L. 19.000 I.L. 17.523
FMH 2.10 B C.L. 19.900 I.L. 18.475
FMH 2.9 C.L. 17.850 I.L. 16.200
FMH 2.8 C.L. 16.250 I.L. 14.250
FMH 2.7 C.L. 15.400 I.L. 13.963
FMH 2.6 C.L. 14.900 I.L. 13.400
FMH 2.6 A C.L. 15.600 I.L. 13.975
FMH 2.5 C.L. 13.950 I.L. 12.324
FMH 2.4 C.L. 10.600 I.L. 8.807
FMH 2.4 A C.L. 10.550 I.L. 9.031
FMH 2.4 B C.L. 11.000 I.L. 9.850
FMH 2.3 C.L. 10.450 I.L. 8.529
FMH 4.1 C.L. 11.100 I.L. 9.752
FMH 4.2 C.L. 12.400 I.L. 10.700
OMH 1 C.L. 10.00 I.L. 8.20
OMH 2 C.L. 10.00 I.L. 8.14
OMH 3 C.L. 9.10 I.L. 7.90
OMH 3A C.L. 9.05 I.L. 8.20
OMH 4 I.L. 7.85
OMH 5 C.L. 9.00 I.L. 8.20
OMH 6 I.L. 8.18
OMH 36 C.L. 14.70 I.L. 13.19

LEGEND

- Site Boundary
- Ø 150mm HDPE Rising Main — Proposed Ø 150mm HDPE Rising Main
- FMH 10.1 C.L. 14.70 I.L. 13.19 / 300 Ø 1/300 (4.9) — Proposed Foul Sewer and Manhole
- Proposed Inspection Chamber and Connection
- SMH 36 C.L. 14.70 I.L. 13.19 / 300 Ø 1/300 (4.9) — Proposed Storm Sewer and Manhole
- Proposed Soakpit
- OMH 36 C.L. 14.70 I.L. 13.19 / 300 Ø 1/300 (4.9) — Proposed Overflow Network and Manhole
- Proposed Storm overflow Retention Swale
- Proposed Petrol Interceptor
- 15.00 — Proposed Level
- FFL 00.00 — Finished Floor Level
- Rising Main marker post

NOTES:

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING.
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
3. ENGINEER/EMPLOYERS REPRESENTATIVE, AS APPROPRIATE, TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
4. THE CONTRACTOR SHALL UNDERTAKE A THOROUGH CHECK FOR THE ACTUAL LOCATION OF ALL SERVICES/UTILITIES, ABOVE AND BELOW GROUND, BEFORE ANY WORK COMMENCES
5. ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Rev	Date	Description	By	Chkd.
D	02.12.2019	Minor revisions to Layout IW Comments Addressed	RD	BH
C	05.11.2019	Revised Architect Layout	JK	RD
B	17.07.19	New Background	FG	RD
A	10.07.19	First Issue	JK	BH

Client: Kegata Ltd

Project: Residential Development at Roshill Galway

Title: Proposed Drainage Layout Part 1

Scale @ A1: 1:500 A3: 1:1000

Prepared by:	Checked:	Date:
JK	BH	July 2019

Project Director: M. McD.

Drawing Status: Plannning

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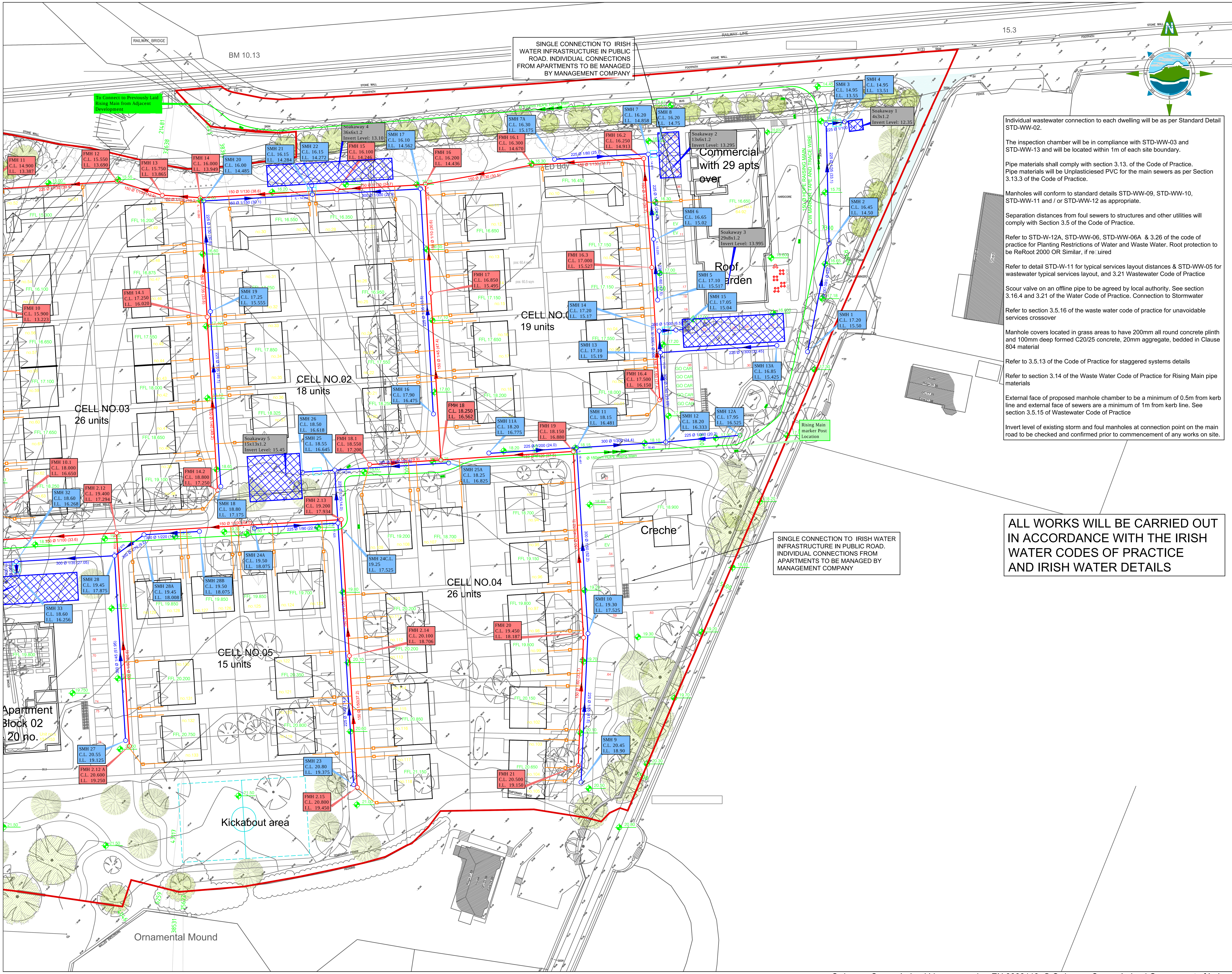
Drawing No.: 10690-2002 Revision: D



Individual wastewater connection to each dwelling will be as per Standard Detail STD-WW-02.

The inspection chamber will be in compliance with STD-WW-03 and STD-WW-13 and will be located within 1m of each site boundary.

Pipe materials shall comply with section 3.13. of the Code of Practice.
Pipe materials will be Unplasticiesed PVC for the main sewers as per Section 3.13.3 of the Code of Practice.

Manholes will conform to standard details STD-WW-09, STD-WW-10, STD-WW-11 and / or STD-WW-12 as appropriate.

Separation distances from foul sewers to structures and other utilities will comply with Section 3.5 of the Code of Practice.

Refer to STD-W-12A, STD-WW-06, STD-WW-06A & 3.26 of the code of practice for Planting Restrictions of Water and Waste Water. Root protection to be ReRoot 2000 OR Similar, if re□uired

Refer to detail STD-W-11 for typical services layout distances & STD-WW-05 for wastewater typical services layout, and 3.21 Wastewater Code of Practice

Scour valve on an offline pipe to be agreed by local authority. See section 3.16.4 and 3.21 of the Water Code of Practice. Connection to Stormwater

Refer to section 3.5.16 of the waste water code of practice for unavoidable services crossover

Manhole covers located in grass areas to have 200mm all round concrete plinth and 100mm deep formed C20/25 concrete, 20mm aggregate, bedded in Clause 804 material

Refer to 3.5.13 of the Code of Practice for staggered systems details

Refer to section 3.14 of the Waste Water Code of Practice for Rising Main pipe materials

External face of proposed manhole chamber to be a minimum of 0.5m from kerb line and external face of sewers are a minimum of 1m from kerb line. See section 3.5.15 of Wastewater Code of Practice

Invert level of existing storm and foul manholes at connection point on the main road to be checked and confirmed prior to commencement of any works on site.

ALL WORKS WILL BE CARRIED OUT IN ACCORDANCE WITH THE IRISH WATER CODES OF PRACTICE AND IRISH WATER DETAILS

LEGEND

- Site Boundary
- Proposed Ø 150mm HDPE Rising Main
- Proposed Foul Sewer and Manhole (FMH 10.1 C.L. 14.70 I.L. 13.19; 300 Ø 1/300 (4.9))
- Proposed Inspection Chamber and Connection
- Proposed Storm Sewer and Manhole (SMH 36 C.L. 14.70 I.L. 13.19; 300 Ø 1/300 (4.9))
- Proposed Soakpit
- Proposed Overflow Network and Manhole (OMH 36 C.L. 14.70 I.L. 13.19; 300 Ø 1/300 (4.9))
- Proposed Storm overflow Retention Swale
- Proposed Petrol Interceptor
- Proposed Level (15.00)
- Finished Floor Level (FFL 00.00)
- Rising Main marker post

N O T E S:

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Rev	Date	Description	By	Chkd.
D	02.12.19	Minor revisions to layout Irish Water commetns addressed	RD	BH
C	05.11.2019	Revised Architect Layout	JK	RD
B	17.07.19	New Background	FG	RD
A	10.07.19	First Issue	JK	BH

Client: Kegata Ltd

Project: Residential Development at Roshill Galway

Title: Proposed Drainage Layout Part 2

Scale @ A1: 1:500 A3: 1:1000

Prepared by: JK | Checked: BH | Date: July 2019

Project Director: M. McD.

Drawing Status: Plannning

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Drawing No.: 10690-2003 Revision: D