Environmental Impact Assessment Report (EIAR)
Volume 1 Main Statement

Strategic Housing Development at Clonattin, Gorey

January 2021

Prepared by McGill Planning

In association with
CS Consulting Group
The Big Space Landscape Architects
Traynor Environmental
IAC Archaeology
Altemar

McGill Planning
Chartered Town Planners

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1 INTRODUCTION AND METHODOLOGY

1.1 INTRODUCTION

This Environmental Impact Assessment Report (EIAR) has been prepared on behalf of Axis Construction Ltd. to accompany a Strategic Housing Development application to An Bord Pleanála for a new residential development on lands located to the south of Clonattin Village, and north of the R742 Courtown Road, in the townlands of Goreybridge, Clonattin Upper and Raheenagurren East, Gorey, Co. Wexford, in accordance with the Planning and Development (Housing) and Residential Tenancies Act 2016.

The subject site is a greenfield site located within Clonattin Upper, to the east of Gorey town. This site has been identified for residential development and the provision of new public open spaces in the Local Area Plan. The site is bound to the north by Clonattin Village Road and existing residential developments. The lands to the south and east consists of agricultural fields.

The proposed development seeks to deliver a significant quantum of residential development at this site within short walking distance of a multitude of services, public transport options, employment and amenities in Gorey town.

The subject site has a gross area of c. 15.7ha.

The proposed strategic housing development at this site in Clonattin, Gorey will include the demolition of the existing buildings and will provide 363 no. residential units, a creche, public open space, a new bridge and access road connecting to Courtown Road. All associated site development works and services provisions including parking, bin storage, substations, landscaping and all services required to facilitate the proposed development.

A full detailed description of the development is provided in Chapter 3 of this EIAR and in the statutory notices.

1.2 METHODOLOGY

Certain public and private projects that are likely to have significant effects on the environment are subject to EIA requirements derived from EIA Directive 85/337/EC (as amended by Council Directive 97/11/EC, Directive 2003/35/EC, Directive 2009/31/EC, Directive 2011/92/EU and Directive 2014/52/EU.

The EIA Directives have been transposed into the Irish land use planning consent system by way of the Planning & Development Acts 2000 (as amended), and the Planning & Development Regulations 2001-18.

The most recent amendment to the Regulations - the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (S.I. No. 296 of 2018) - transposed Directive 2014/52/EU into Irish law.

Complementary to the legislation is a range of guidelines produced by the EU and government agencies to inform the carrying out of EIA:

- EU Guidance on EIA Screening (DG Environment 2001).
- Guidance on EIA Scoping (DG Environment 2001).
- EIA Review Checklist (DG Environment 2001).
- Guidelines on Information to be Contained in an Environmental Impact Statement (EPA 2002).
- Study on the Assessment of Indirect & Cumulative Impacts as well as Impact Interaction (DG Environment 2002).
- Environmental Impact Assessment (EIA), Guidance for Consent Authorities Regarding Sub-Threshold Development (DoEHLG 2003).
- Advice Notes on Current Practice (in preparation of Environmental Impact Statements) (EPA 2003).
- Development Management Guidelines (DoEHLG, 2007).
- Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA 2017)
- Transposition of 2014 EIA Directive (2014/52/EU) in the Land Use Planning and EPA Licencing Systems - Key Issues Consultation Paper (Department of Environment, Community and Local Government, 2017).
- Circular letter PL 1/2017 - Advice on Administrative Provisions in Advance of Transposition (Department of Housing, Planning and Local Government, 2017).
- Environmental Impact Assessment of Projects – Guidance on the Preparation of the Environmental Impact Assessment Report (European Commission 2017)
- Environmental Impact Assessment of Projects – Guidance on Screening (European Commission 2017)
- Environmental Impact Assessment of Projects – Guidance on Scoping (European Commission 2017)
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning and Local Government, 2018).

1.3 DEFINITION OF EIA

Article 171A of the 2018 Regulations defines *'environmental impact assessment' as:*

"… a process

a) consisting of:

(i) the preparation of an environmental impact assessment report by the applicant in accordance with this Act and regulations made thereunder,

(ii) the carrying out of consultations in accordance with this Act and regulations made thereunder,

(iii) the examination by the planning authority or the Board, as the case may be, of-

i. the information contained in the environmental impact assessment report,

ii. any supplementary information provided, where necessary, by the applicant in accordance with section 172(1D) and (1E), and

iii. any relevant information received through the consultations carried out pursuant to subparagraph (ii),

(iv) the reasoned conclusion by the planning authority or the Board, as the case may be, on the significant effects on the environment of the proposed development, taking into account the results of the examination carried out pursuant to subparagraph (iii) and, where appropriate, its own supplementary examination, and

(v) the integration of the reasoned conclusion of the planning authority or the Board, as the case may be, into the decision on the proposed development, and

b) which includes:

(i) an examination, analysis and evaluation, carried out by the planning authority or the Board, as the case may be, in accordance with this Part and regulations made thereunder, that identifies, describes and assesses, in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of the proposed development on the following:

i. population and human health;

ii. biodiversity, with particular attention to species and habitats protected under the Habitats Directive and the Birds Directive;
iii. land, soil, water, air and climate;
iv. material assets, cultural heritage and the landscape;
v. the interaction between the factors mentioned in clauses (I) to (IV), and

(ii) as regards the factors mentioned in subparagraph (i)(I) to (V), such examination, analysis and evaluation of the expected direct and indirect significant effects on the environment derived from the vulnerability of the proposed development to risks of major accidents or disasters, or both major accidents and disasters, that are relevant to that development;

1.4 EIA SCREENING

Section 176(A) of the Act, as amended by S.I. 296/2018, defines *'screening for environmental impact assessment'* as

".. a determination—
(a) as to whether a proposed development would be likely to have significant effects on the environment, and
(b) if the development would be likely to have such effects, that an environmental impact assessment is required."

Section 172 of the Act states that an EIA shall be carried out respect of an application for consent for proposed development where either of the following are relevant:

(a) the proposed development would be of a class specified in—
(i) Part 1 of Schedule 5 of the Planning and Development Regulations 2001, and either—
I) such development would exceed any relevant quantity, area or other limit specified in that Part, or
II) no quantity, area or other limit is specified in that Part in respect of the development concerned,
or
(ii) Part 2 of Schedule 5 of the Planning and Development Regulations 2001 and either—
I) such development would exceed any relevant quantity, area or other limit specified in that Part, or
II) no quantity, area or other limit is specified in that Part in respect of the development concerned,
or
(b) (i) the proposed development would be of a class specified in Part 2 of Schedule 5 of the Planning and Development Regulations 2001 but does not exceed the relevant quantity, area or other limit specified in that Part, and
(ii) the planning authority or the Board, as the case may be, determines that the proposed development would be likely to have significant effects on the environment.

The subject site falls within the development classes set out in Part 1 of Schedule 5.

The following development classes set out in Part 2 of Schedule 5 are noted:

- *10(b)(i) Construction of more than 500 units*
- *10(b)(iv) Urban development which would involve an area greater than 2 hectares in the case of a business district, 10 hectares in the case of other parts of a built-up area and 20 hectares elsewhere. (In this paragraph, "business district" means a district within a city or town in which the predominant land use is retail or commercial use.)*

The gross area of the application site is c. 15.7 ha, which is above the 10ha threshold for a built-up area.

The proposed development for 363 no. units, which is below the 500 no. units threshold.

Development Class 15 in Part 2 of Schedule 5 is also noted:

- *15 Any project listed in this Part which does not exceed a quantity, area or other limit specified in this Part in respect of the relevant class of development, but which would be likely to have significant effects on the environment, having regard to the criteria set out in Schedule 7.*

Schedule 7 of the Regulations lists the criteria for determining whether Development listed in Part 2 of Schedule 5 should be subject to an EIA. These are:

1. Characteristics of proposed development
The characteristics of proposed development, in particular—
(a) the size and design of the whole of the proposed development,
(b) cumulation with other existing development and/or development the subject of a consent for proposed development for the purposes of section 172(1A) (b) of the Act and/or development the subject of any development consent for the purposes of the Environmental Impact
Assessment Directive by or under any other enactment,
(c) the nature of any associated demolition works,
(d) the use of natural resources, in particular land, soil, water and biodiversity,
(e) the production of waste,
(f) pollution and nuisances,
(g) the risk of major accidents, and/or disasters which are relevant to the project concerned, including those caused by climate change, in accordance with scientific knowledge, and
(h) the risks to human health (for example, due to water contamination or air pollution).

2. Location of proposed development
The environmental sensitivity of geographical areas likely to be affected by the proposed development, with particular regard to—
(a) the existing and approved land use,
(b) the relative abundance, availability, quality and regenerative capacity of natural resources (including soil, land, water and biodiversity) in the area and its underground,
(c) the absorption capacity of the natural environment, paying particular attention to the following areas:
(i) wetlands, riparian areas, river mouths;
(ii) coastal zones and the marine environment;
(iii) mountain and forest areas;
(iv) nature reserves and parks;
(v) areas classified or protected under legislation, including Natura 2000 areas designated pursuant to the Habitats Directive and the Birds Directive and;
(vi) areas in which there has already been a failure to meet the environmental quality standards laid down in legislation of the European Union and relevant to the project, or in which it is considered that there is such a failure
(vii) densely populated areas;
(viii) landscapes and sites of historical, cultural or archaeological significance.

3. Types and characteristics of potential impacts
The likely significant effects on the environment of proposed development in relation to criteria set out under paragraphs 1 and 2, with regard to the impact of the project on the factors specified in paragraph (b)(i)(I) to (V) of the definition of 'environmental impact assessment report' in section 171A of the Act, taking into account—
(a) the magnitude and spatial extent of the impact (for example,
geographical area and size of the population likely to be affected),
(b) the nature of the impact,
(c) the transboundary nature of the impact,
(d) the intensity and complexity of the impact,
(e) the probability of the impact,
(f) the expected onset, duration, frequency and reversibility of the impact,
(g) the cumulation of the impact with the impact of other existing and/or development the subject of a consent for proposed development for the purposes of section 172(1A) (b) of the Act and/or development the subject of any development consent for the purposes of the
Environmental Impact Assessment Directive by or under any other enactment, and
(h) the possibility of effectively reducing the impact.

The subject site area for this application is above the threshold set out in Development Class 10 of Part 2 of Schedule 5 of the Planning & Development Regulations. An EIAR is therefore automatically required.

1.5 EIA SCOPING

Section 173(2) (a) of the Planning and Development Act 2000 (as amended) provides that a formal request for scoping may be submitted to the planning authority. However, the 'Draft Guidelines on the Information to be contained in Environmental Impact Assessment Reports' (2017), confirm that **this is not mandatory.**

The EIAR team carried out a scoping exercise to identify the key issues that may be considered likely to have a significant effect on the environment. Regard was also had to EIAR carried out for other developments in the neighbourhood.

In accordance with the draft EPA Guidelines (2017), those issues that do not meet the threshold of significance have been 'scoped out'. The following issues have been identified in the context of the proposed development:

- Population & Human Health
- Biodiversity
- Lands, Soils & Geology
- Hydrology & Water Services
- Noise & Vibration
- Air & Climate
- Landscape & Visual
- Traffic & Transportation
- Material Assets
- Waste Management
- Cultural Heritage

1.6 EIAR OBJECTIVES

The EIA process is based on the following four principles:

- *Pursuing Preventative Action*

An assessment of anticipated likely and significant impacts was undertaken during the screening and the considerations of alternatives stages of the EIA process. This involved forming a preliminary opinion with respect to the approximate magnitude and character of the likely environmental impacts. This assessment was based on the knowledge, experience and expertise of the EIA team with reference to EIA guidance material and local information.

- *Maintaining Environmental Focus and Scope*

The EIA process has focussed on those issues where environmental impact is likely to occur and have significant effects.

- *Informing the Decision*

The EIAR has been developed and is presented in such a way as to facilitate the authority decision on the acceptability of the proposed development in the full knowledge of the project's likely significant impacts on the environment, if any.

- *Public & Stakeholder Participation*

Participation is provided through the statutory planning process which allows for public participation and consultation while receiving advice from other key stakeholders and statutory authorities with specific environmental responsibilities.

1.7 EIAR FORMAT AND CONTENT

This EIAR is sub divided as follows:

- Environmental Impact Assessment Report
- Appendices to Environmental Impact Assessment Report
- Non-Technical Summary.

The EIAR has been prepared in the Grouped Format as set down in the EPA "Guidelines on Information to be contained in an EIS" (2002) and the 'Draft Guidelines on the Information to be contained in Environmental Impact Assessment Reports' (2017). In general, the EIAR follows the framework presented in the EPA "Advice Notes on Current Practice in the Preparation of Environmental Impact Statements" (September 2003).

The content and responsibility of the EIAR chapters is outlined below:

Chapter	Title	Consultant
1.	Introduction & Methodology	McGill Planning Ltd.
2.	Alternatives Considered	McGill Planning Ltd.
3.	Description of Development	McGill Planning Ltd.
4.	Population & Human Health	McGill Planning Ltd.
5.	Biodiversity	Altemar
6.	Land, Soils & Geology	Cronin and Sutton Consulting Engineers
7.	Hydrology and Water Services	Cronin and Sutton Consulting Engineers
8.	Noise and Vibration	Traynor Environmental
9.	Climate and Air Quality	Traynor Environmental

10.	Landscape and Visual	McGill Planning Ltd.
11.	Traffic & Transportation	Cronin and Sutton Consulting Engineers
12.	Material Assets	JAK Consulting Engineers
13.	Cultural Heritage	IAC Archaeology
14.	Waste Management	Traynor Environmental
15.	Interactions	McGill Planning Ltd.
16.	Summary of Mitigations Measures	McGill Planning Ltd.

Table 1-1 Content and Responsibility of the EIAR

1.8 EIAR STRUCTURE

The preparation of this EIAR requires the co-ordination and synthesis of associated yet diverse elements of the overall assessment. To facilitate this process, a schematic structure is proposed in order to provide a coherent documentation of the varied aspects of the environment considered. The grouped format structure of the Environmental Impact Statement is listed below with a brief outline of each specific stage.

Methodology
The specific approach or techniques used to analyse impacts or describe environments.

Receiving Environment (Baseline Situation)
Dynamic description of the specific environment into which the proposal will fit, taking account of other developments likely to occur. The context, character, significance and sensitivity of the baseline is described. The likely evolution of baseline environmental characteristics without implementation of the proposed project.

Characteristics of the Proposed Development
Description of the physical characteristics of a project having regard to:

- the site location
- the size, design and appearance of the proposed project
- the cumulation with other proposed projects
- the use of natural resources
- the production of waste
- emissions and nuisances
- The potential risk of accidents.

The description of the development should take account of the full 'life-cycle' including construction, commissioning (if relevant), operation, changes to the project and potential decommission.

Potential Impacts
The potential impact of the proposal comprises a general description of the possible types of impacts which proposals of this kind would be likely to produce. Impact assessment addresses direct, indirect, secondary, cumulative, transboundary, short, medium and long term, permanent, temporary, positive and negative effects as well as impact interactions. This includes consideration of a 'Do Nothing' impact which describes the environment as it would be in the future if the development is not carried out.

Mitigation Measures
A description of any specific remedial or reductive measures considered necessary and practicable resulting from the assessment of potential impacts described above.

Predicted Impacts
An assessment of the net specific impact of the proposal, noting the direct, indirect, secondary, cumulative, transboundary, short, medium and long term, permanent, temporary, positive and negative effects as well as impact interactions which the proposed development may have. The predicted impact assumes all mitigation measures are fully and successfully applied. A 'Worst Case' impact is also considered. A 'Worst Case' impact is an impact arising where a development or its mitigation measures substantially fail.

Monitoring
A description of any post development monitoring of effects of the environment which might be necessary.

Reinstatement
A description of any post development reinstatement measures which might be necessary.

1.9 COMPETENCY

For the preparation of this EIAR, the applicant engaged McGill Planning Ltd. to project manage and coordinate the preparation of the EIAR with a team of qualified specialists engaged to prepare individual chapters, as listed in the table below. Details of the competency, qualifications and experience of the authors is also outlined:

Chapter	**Consultancy**	**Lead Consultant**	**Qualifications**
Introduction & Methodology	McGill Planning	Brenda Butterly	BSc Surv, MRUP, MAUD, MIPI, MRTPI
Examination of Alternatives		Trevor Sadler	Master of Regional & Urban Planning, MIPI
Description of Development			
Population & Human Health			
Landscape and Visual			
Interactions			
Summary of Mitigations Measure			
Biodiversity	Altemar	Bryan Deegan	MCIEEM-Member of the Chartered Institute of Ecology and Environmental Management; M.Sc. Environmental Science, Trinity College Dublin (1996) (Hetac 9); BSc (Hons.) in Applied Marine Biology, Heriot-Watt University, (1994) (Hetac 8); National Diploma in Applied Aquatic Science, GMIT (1992) (Hetac 8); National Certificate in Science (Aquaculture), GMIT (1991) (Hetac 6).
Soils & Geology	Cronin and Sutton Consulting Engineers	Gary Lindsay	BE CEng
Water Services	Cronin and Sutton Consulting Engineers	Gary Lindsay	BE CEng

Traffic & Transportation	Cronin and Sutton Consulting Engineers	Gordon Finn	BA BAI MAI
Material Assets	Cronin and Sutton Consulting Engineers JAK Consulting Engineers	Gary Lindsay Anna Weslowska Martin Obst	C.Eng/MSc,BSc Engineering M.Eng(Hons) MIEI/SEAI Building Energy Rating Assessor
Noise	Traynor Environmental	Nevin Traynor	BSc. Env, H.Dip I.T, Cert SHWW
Air Quality & Climate Impact			
Waste Management			
Cultural Heritage and Archaeology	IAC Archaeology	Grace Corbett	MA in Landscape Archaeology

Table 1-2 Competencies of Consultants

1.10 DIFFICULTIES IN COMPILING THE SPECIFIED INFORMATION

There were no significant difficulties in completing the Environmental Impact Assessment Report. Any minor difficulties are presented in each of the respective chapters.

1.11 ERRORS

While every effort has been made to ensure that the content of this EIAR is consistent there may be instances where typographical errors and/or minor inconsistencies do occur. These are unlikely to have any material impact on the overall findings and assessment contained in this EIAR.

Please note that any red line site boundary shown in this document is for illustrative purposes only. The architect's drawings should be consulted for an accurate red boundary line.

1.12 AVAILABILITY OF THE EIAR

A copy of this EIAR document and Non-Technical Summary of the EIAR document is available for purchase at the offices of Wexford County Council at a fee not exceeding the reasonable cost of reproducing the document.

Additionally, prior to lodging this application, the required information has been issued for the Department of Housing, Planning and Local Government's EIA Portal.

2 ALTERNATIVES CONSIDERED

2.1 INTRODUCTION

This section of the EIAR has been prepared by McGill Planning Ltd, Planning & Development Consultants. It provides an outline of the main alternatives considered and a justification for the final proposed development, as required by the EIA Directive (as amended).

2.2 TERMS OF REFERENCE

The Guidelines for Planning Authorities and An Bord Pleanála on Carrying out Environmental Impact Assessment (2018) state the following:

> *"The Directive requires that information provided by the developer in an EIAR shall include a description of the reasonable alternatives studied by the developer. These are reasonable alternatives, which are relevant to the project and its specific characteristics. The developer must also indicate the main reasons for the option chosen taking into account the effects of the project on the environment.*
>
> *Reasonable alternatives may relate to matters such as project design, technology, location, size and scale."*

This section of the EIAR document provides an outline of the main alternatives examined throughout the design and consultation process under the following headings:

- Alternative Locations
- Alternative Designs and Layouts
- Alternative Processes

This serves to indicate the main reasons for choosing the development proposed, taking into account and providing a comparison of the environmental effects. The type of alternatives depends on the nature of the project proposed and the characteristics of the receiving environment.

The 2018 Guidelines also note that it is generally sufficient for the developer to provide a broad description of each main alternative studied and the key environmental issues. Furthermore, a 'mini- EIA' is not required for each alternative studied.

2.3 ALTERNATIVE LOCATIONS

The 2018 Guidelines note that some projects may be "site specific" so the consideration of alternative sites may not be relevant or warranted.

This point is also stated in the Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2017), which states that in some instances alternative locations may not be applicable or available for a specific project which is identified for a specific location. With regard to locations, the considerations of alternatives in many cases will already have been addressed and decided at strategic planning level during the adoption of city/county/local developments plans. Furthermore, these plans will have been subject to Strategic Environmental Assessment (SEA) which will have taken into account the environmental considerations associated with, for example, the cumulative impact of an area zoned for industry on a sensitive landscape. The Guidelines also state that the statutory development plans can establish project-level objectives or other mitigation that a subsequent site project and its EIAR should be cognisant of.

In this regard, we note that the subject site is located within Wexford County Council administrative area and is primarily zoned for residential development in the Gorey Town and Environs Local Area Plan 2017-2023. As this site is zoned for residential development within an established residential area, it was not considered necessary to consider other sites.

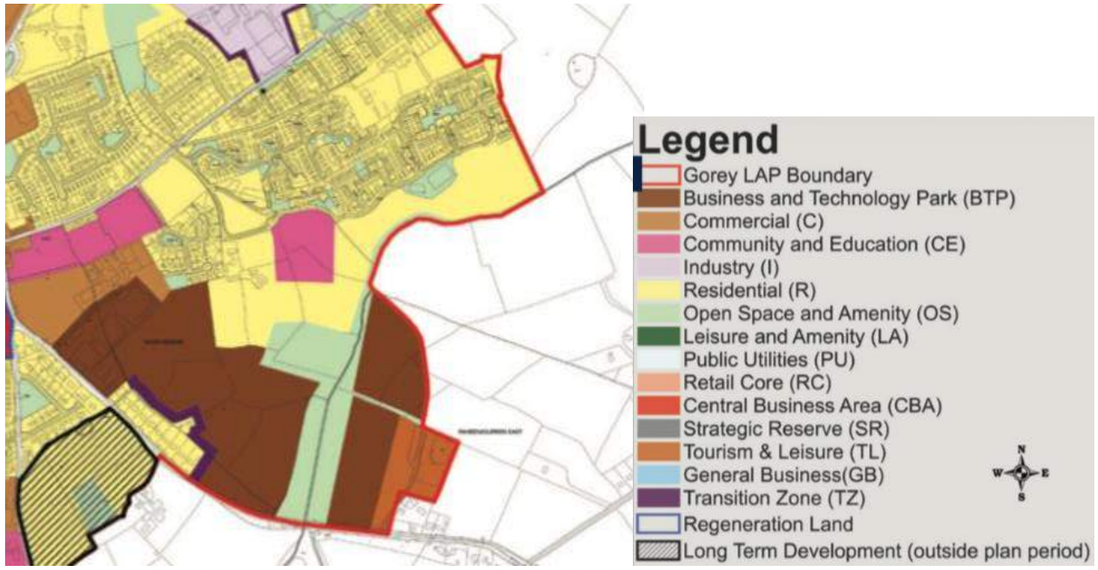


Figure 2-1 Extract from Gorey Town and Environs Local Area Plan 2017-2023

2.4 'DO-NOTHING' ALTERNATIVE

As highlighted above the site is zoned for residential development under the Gorey Town and Environs Local Area Plan 2017-2023 and as such, consideration of alternative sites is not necessary. The consideration of an alternative location would equate to a 'do-nothing' alternative for the subject site, the existing vacant buildings would further deteriorate, and the site would become overgrown and unkept. This would mean that these residential zoned lands would not be developed in accordance with the objectives of the Wexford County Development Plan and Gorey & Environs Local Area Plan.

This in turn would have the knock on impact of the development plan and the local area plan not being implemented in an appropriate planned manner, creating pressures to develop unzoned, unserviced or remote sites that would not support sustainable development. This would not be in line with National, Regional or Local plan policies which require the efficient use of zoned land such as these, particularly ones which are close to an established development area.

Furthermore, these lands are considered highly sustainable and suitable for development due to its proximity to a wide range of existing public transport facilities, services and community facilities within the area which are key considerations for the development of any site.

2.5 ALTERNATIVE USES

The Gorey Town and Environs Local Area Plan 2017-2023 notes that housing is the primary use on land zoned residential but that recreation, education, childcare facilities, community buildings, sheltered housing and local services "*will be considered subject to the preservation of neighbouring residential amenity*." The proposed residential use and childcare use therefore accords with the land use zoning set out in the LAP.

Gorey Town Centre, which is in close proximity to the subject site, includes a variety of services, facilities and amenities that will serve the proposed development. The proposed residential units will add to the local population and support existing services and facilities in Gorey. The provision of additional local services or retail within the proposed development was not considered as this could negatively impact on the existing centre and would ultimately be considered contrary to the LAP.

Other uses (such as employment, industrial or institutional) were not considered, as they would not accord with the land-use zoning for this site.

2.6 ALTERNATIVE DESIGNS AND LAYOUT

This is a greenfield site located adjacent to the existing residential area of Gorey, Co. Wexford. The layout, scale, quantum, density and design of the proposed development has had due regard to its setting. Five different layouts and designs (Alternatives A-E) were considered for this site. The red line boundary changed slightly between alternatives as different options were considered. This has resulted in densities that are not perfectly comparable between alternatives.

A number of site constraints and guiding principles, illustrated in figure 2-2, influenced the site layout's design:

- The locations of existing residential developments, entrances, houses and public open spaces.
- The locations of existing trees, hedgerows, watercourses and water bodies.
- The land use zonings and the layout set out in the LAP.

Figure 2-2 Concept and key principles underpinning the design. Source: Reddy Architecture and Urbanism

Alternative A – Low Density

Two low density layouts were designed for this site in 2012 and 2013. The first provided 206 no. residential units on the site with a residential density of c. 15 units/hectare. The second provided a residential density of c. 14 units per hectare with 197 no. units. Outline planning permission was granted by Wexford County Council for a 206 no. unit scheme in December 2013 (WXCC Reg. Ref.: 2013/0002).

The layout of both of these designs was broadly similar. The layout is provided in a grid-like pattern with terraced and detached housing arranged in 14 zones (A-N).

The layout includes a linear park along the eastern and southern boundary from the attenuation pond in the south of the site to the existing open space to the north-east of the site. A playground is provided at the north-eastern side of this linear park. A second open space is provided in the west of the site, east of Zone D and a small open space is located within Zone F.

The site boundary excludes the area zoned Community and Education and provides a playout for planning pitches.

Environmental Effects

This alternative layout would result in the loss of a significant number of existing trees and hedgerows. The proposed open spaces are also minimal and would not provide sufficient new planting to mitigate against the loss of existing trees and hedgerows. Therefore, this layout would have a detrimental impact on the local ecology and biodiversity in both the short and long term.

This alternative results in car dominated layout with long, uninterrupted stretches of road which would increase car speeds through the development. The development does not provide attractive routes through the development for pedestrians or cyclists. Therefore, it can be expected that residents would depend on cars even for short trips within the development and to nearby services in Gorey town. This car dependency would increase greenhouse gas emissions, air pollution and traffic congestion. It would also remove activity from the future residents' lives which will contribute to increasing levels of sedentary lifestyles with a negative impact on public health. The proposal also does not provide any connections to adjoining lands, creating an impermeable area.

In addition, this low density results in less public open space and is not in accordance with the National Planning Framework which promotes compact growth and increased densities in existing settlements.

Zone	No.	Type
A	16	Terrace Townhouse
B	11	Terrace Townhouse/detached
C	18	Terrace Townhouse
D	10	Detached
E	22	Terrace/Detached
F	33	Terrace/Detached
G	0	Open Space-Scenic walk
H	12	Detached
I	15	Detached
J	20	Terrace
K	22	Terrace
L	8	Terrace
M	10	Terrace/Detached
N	9	Terrace
Total	206	

Figure 2-3 Alternative A - November 2012

Zone	No.	Type
A	15	Terrace Townhouse
B	11	Terrace Townhouse/detached
C	17	Terrace Townhouse
D	12	Detached
E	20	Terrace/Detached
F	33	Terrace/Detached
G	0	Open Space-Scenic walk
H	12	Detached
I	14	Detached
J	18	Terrace
K	20	Terrace
L	9	Terrace
M	7	Terrace/Detached
N	9	Terrace
Total	197	

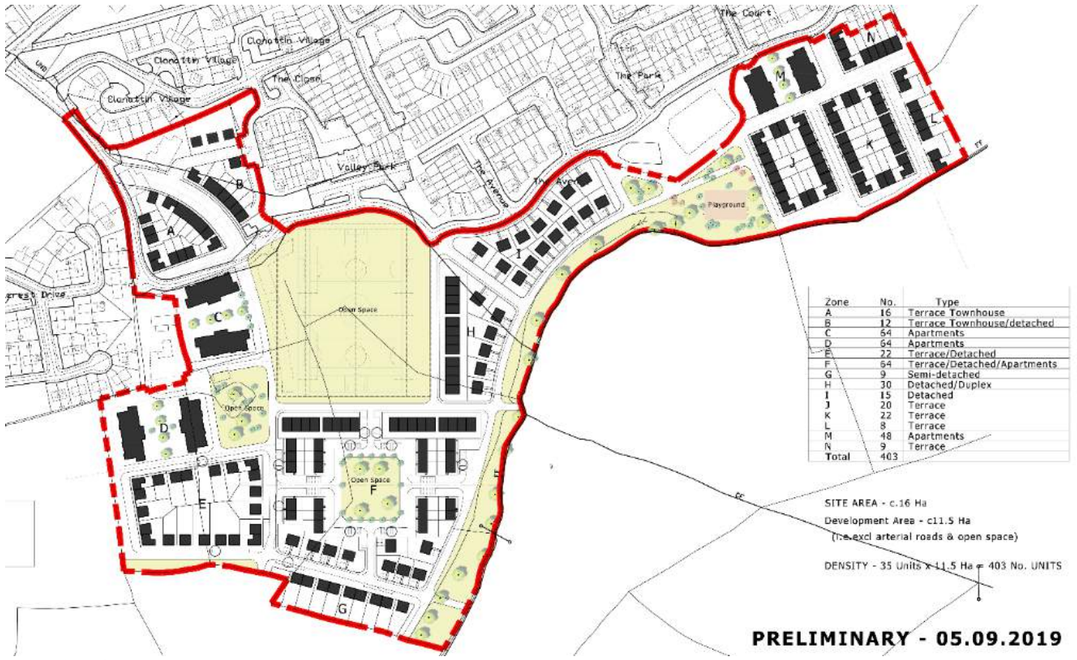
Figure 2-4 Alternative A - April 2013

Alternative B

This alternative layout provides a density of c. 35 units per hectare. The design provides 403 no. units comprising detached, semi-detached and terraced housing, and apartment blocks on a net site area of c.11.5 hectares (the current application net site area is slightly smaller). The site area for this layout includes the entire area zoned Community and Education (CE), as a result the density appears lower than expected. In comparison, the net site area for the application subject to this EIAR is c. 9.56ha.

This alternative follows a similar layout to Alternative A with housing units provided in 14 zones (A-N). The most significant differences between this alternative and Alternative A are

- the absence of the attenuation pond in the south-east corner of the site;
- the inclusion of the Community and Education (CE) zoned land within the site boundary;
- the increased sqm of open space provided in Zone F; and
- the inclusion of apartment blocks and duplex units as follows:
    - Zones C, D and M solely comprise apartments replacing the detached and terraced housing provided in Alternative A,
    - Zone H includes duplexes in place of the detached houses provided in Alternative A,
    - Zone F includes apartments in place of some detached houses.



Zone	No.	Type
A	16	Terrace Townhouse
B	12	Terrace Townhouse/detached
C	64	Apartments
D	64	Apartments
E	22	Terrace/Detached
F	64	Terrace/Detached/Apartments
G	9	Semi-detached
H	30	Detached/Duplex
I	15	Detached
J	20	Terrace
K	22	Terrace
L	8	Terrace
M	48	Apartments
N	9	Terrace
Total	403	

Figure 2-5 Alternative B - August 2019

Environmental Effects

This layout would result in the loss of a significant number of existing trees and hedgerows. In particular, the loss of the attenuation pond would significantly reduce both existing habitats and the potential for new habitats in this area. Although this alternative includes a large central open space, there is not enough proposed planting and open space to mitigate against the loss of the trees and hedgerows and their associated habitats.

Although this layout provides a higher density than alternative A, the layout and design does not create a scheme in which pedestrians and cyclists are prioritised. Therefore, this layout would likely result in continued car dependence in the area.

Alternative C

Three versions of this alternative were explored. The three layouts provide c. 375 no. units and an approximate residential density of 35 units per hectare.

This layout also provides the housing units in a grid like patten. The housing units are provided in terraced housing and apartment blocks.

This layout includes the entire area zoned Community and Education, which provides a large central open space in the development. The attenuation pond is maintained, and a public open space created around it. A small open space is provided between the large central open space and the open space by the attenuation pond. A strip of open space along eastern boundary from the south-east corner to the existing playground to the north is provided.

This alternative also includes provision for an access road to the east.

Environmental Effects

This alternative retains more of the existing trees and hedgerows when compared with alternative A and B. The retention of the attenuation pond in the south-west corner will provide further habitats and biodiversity within the site. However, a 10m buffer of Clonattin Stream is not provided along the entire length of the stream bounding the site.

The higher residential density in this location close to Gorey town centre would help to counter-balance continued sprawl and unsustainable patterns of development. It would also provide compact growth within an existing settlement, in line with the objectives of the National Planning Framework. However, despite this density and the provision of more open space, the layout is still road dominated and would be unlikely to encourage walking and cycling as viable modes of transport. The increased density combined with high car usage would have a significant negative effect on traffic congestion levels and greenhouse gas emissions. It would also contribute to increased levels of sedentary lifestyles.

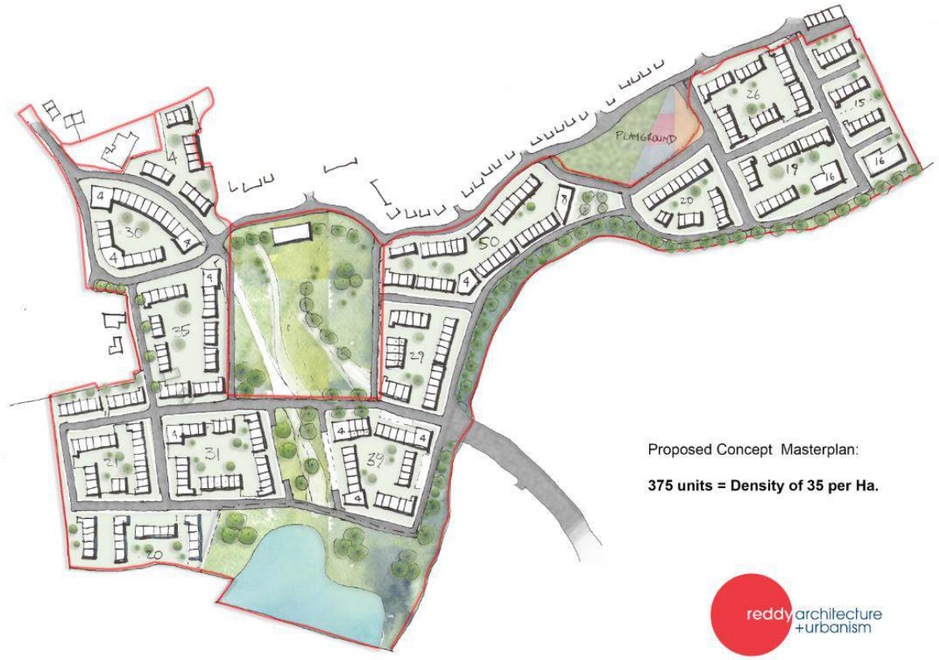


Figure 2-6 Alternative C - September 2019

Figure 2-7 Alternative C - October 2019

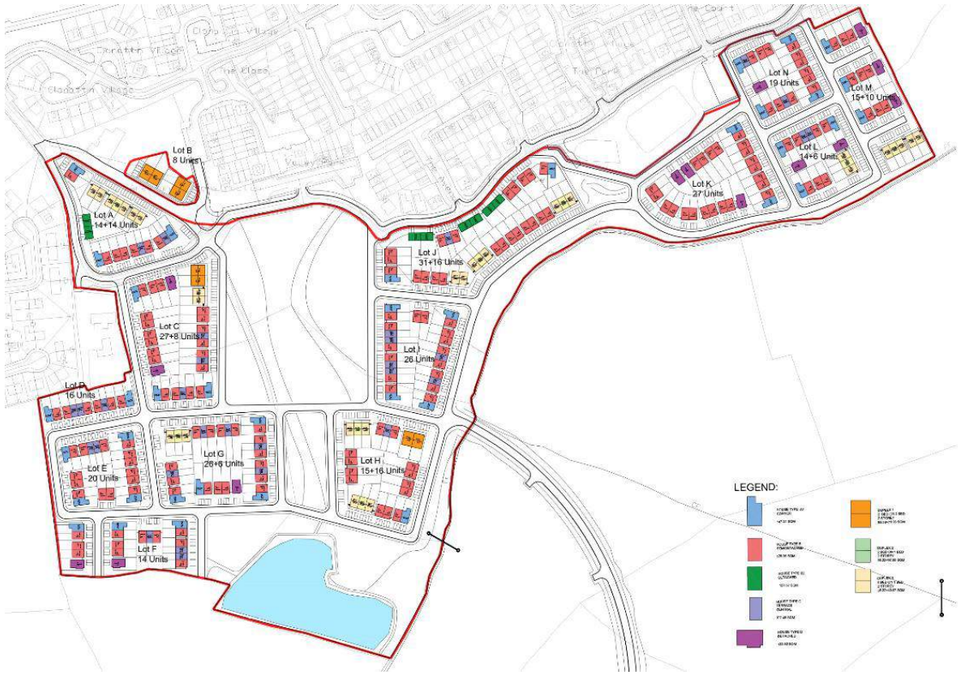


Figure 2-8 Alternative C - November 2019

Figure 2-9 Alternative D - Submitted to ABP at Pre-Planning Consultation in February 2020

Alternative D Presented to An Bord Pleanála at Pre-Planning Consultation

This layout was submitted to An Bord Pleanála at the pre-planning consultation in February 2020. It provides 361 no. residential units with a residential density of 38 units per hectare.

This layout incorporates elements of the previous alternatives. The design follows a similar grid pattern with the residential units provided in a mix of detached, semi-detached, terraced housing and apartment blocks. The linear park along the eastern boundary is provided with a 10m buffer from Clonattin Stream. The attenuation pond is maintained and is integrated into a public open space in the south-east corner. More of the existing trees have been retained by retaining trees in back gardens, setting back houses from the site boundaries.

This layout includes approximately half of the area zoned Community and Education use. It is envisioned that the other half will be used for an education use, such as a school or other community facility, in line with the land use zoning. An indicative school layout is shown on the layout.

Homezones are used to limit the dominance and presence of cars within the development and to create pedestrian priority zones. This layout does not include an access road to the east.

Environmental Effects

The use of homezones will make walking and cycling safer and more attractive for the residents by reducing car speeds and giving priority to pedestrians and cyclists.

The layout protects more trees than the previous alternatives. However, the trees protected in the south-west corner result in less than optimal layout for the houses and would likely result in the loss of these tress over time.

Alterative E The Chosen Layout

This final alternative improves upon the layout presented to An Bord Pleanála at the pre-planning consultation.

The units in the south-west corner have been reconfigured to create an open space around the existing trees. The streets and parking on either side of this open space were designed carefully to provide sufficient root protection space for the trees.

As with Alternative D, this layout includes approximately half of the area zoned Community and Education use. It is envisioned that the other half will be used for an education or community use, such as a school, in line with the land use zoning. An indicative school layout is shown on the layout and initial contact has been made with the Department of Education regarding this proposal. However, however it is not proposed to develop this area as part of this application. Any development on this site would be subject to a future separate planning application.

This alternative includes a creche which is located to the south of the site, adjacent to the open space by the attenuation pond.

This layout includes an access road to the south-east, which will provide access to the site from Courtown road, providing additional connections and accesses to the undeveloped land to the south of the application site, and connections through the site to the Clonattin Village Road.

Environmental Effects

This layout retains existing trees and hedgerows as much as possible, while also providing a high residential density. This allows the national objectives of compact growth to be achieved while also protecting and enhancing existing biodiversity and ecology on site.

The childcare facility has been appropriately located to ensure it is within a short walking distance of all the residential units.

Figure 2-10 Alternative E - The Chosen Layout

2.7 ALTERNATIVE PROCESSES

This is a residential development which also includes a creche located on lands specifically designated for residential development. Given the proposed use of the lands, which is in line with the Land Use Zoning in the Local Area Plan, it is not considered appropriate to assess other processes in the context of this EIAR.

2.8 SUMMARY TABLE OF ALTERNATIVE SITES AND ENVIRONMENTAL IMPACTS

A comparison of the environmental effects of each of these alternative layouts is shown in table 2.1 below. This table compares the operational effects of each alternative on a variety of environmental factors. Each option is compared to the others and are assessed as follows:

- ✓ Is for those that are considered to have a more positive impact than others
- = Where the impact is considered similar for all options
- X Where a particular option is considered to have a more negative impact on a particular aspect of the environment compared to the majority of the others.

It is considered that the chosen design as per this planning application and EIAR in general achieves a better result in terms of impact on the environment than the other design options previously considered.

	A	B	C	D	E (Chosen Layout)
Population and Human Health	X	X	X	=	✓
Biodiversity	X	X	X	=	✓
Soils and Geology	=	=	=	=	=
Hydrology	=	=	=	=	=
Air and Climate	X	=	=	=	=
Noise and Vibration	=	=	=	=	=
Traffic	X	X	X	X	✓
Waste	=	=	=	=	=
Material Assets	✓	✓	✓	✓	✓

Table 2-1 Comparison of Effects

3 DESCRIPTION OF DEVELOPMENT

3.1 INTRODUCTION

This chapter of the EIAR has been prepared by McGill Planning Ltd. with input from the project design team. This chapter describes the nature of the proposed development in accordance with the requirement of the relevant EIA legislation and guidance on preparation and content of the EIAR.

The proposed development is described in the statutory notices as follows:

Axis Construction Limited intend to apply to An Bord Pleanála for permission for a strategic housing development at this site of c.15.7 ha located on lands to the south of Clonattin Village, and north of the R742 Courtown Road, in the townlands of Goreybridge, Clonattin Upper and Raheenagurren East, Gorey, Co. Wexford.

The proposed development will consist of demolition of the existing dwelling and shed on site (c.334.27sqm); construction of 363 no. residential units, comprising 42 no. 1 bed apartments, 59 no. 2 bed apartments, 134 no. 3 bed houses, 124 no. 4 bed houses and 4 no. 5 bed houses, in a range of building typologies ranging in height from 2 to 3 storeys. The proposed development also includes a single storey creche (c. 513 sq.m), new public open spaces, provision of 690 no. car parking spaces and 222 no. cycle parking spaces. The proposal includes for new vehicular and pedestrian accesses and upgrades along Clonattin Village Road to the north, and a new access road (including bridge) to the R472 Courtown Road to the south via the existing access road serving the cinema (with associated upgrades to the existing road and at the junction with the Courtown Road).

All associated site development works (including site reprofiling), landscaping, boundary treatments and services provision including ESB substations.

3.2 CHARACTERISTICS OF THE SITE

The subject site is located within Clonattin Upper, Gorey, Co. Wexford, less than 1km (or a c. 15 minute walk) from Gorey Town Centre.

The subject site measures c. 15.7ha and currently consists primarily of agricultural fields, including hedgerows and mixed vegetation. The north-western portion of the site has been partially cleared and contains a portion of an existing road. The north of the site fronts onto Clonattin village road, which separates the subject site from the existing residential development. Clonattin Stream marks the eastern and southern boundary of the site separating the site from the agricultural lands. The north-eastern portion of the site is covered mixed vegetation and scrub. A large attenuation pond is located within the southern area of the site. The site is bounded to the south and east by further agricultural lands, to the north and west by existing residential developments.

The subject site also includes a section for a new access road to the east and south of the site. This connects the site with Courtown Road to the south, through agricultural fields and the Movies@Gorey cinema lands.

The site is free from any protected structures or monuments and it is not located within a Conservation Area or an Architectural Conservation Area. There are two existing derelict buildings on site but these are not of any architectural or historical merit. The site is not within a Special Area of Conservation (SAC) or Special Protection Area (SPA).

Access into the subject site is currently provided from Clonattin Village Road which marks the site's northern boundary.

Gorey town centre is served by numerous bus routes including Bus Éireann route 2 (Wexford – Dublin Airport), Wexford Bus 704 (Wexford – Dublin Airport) and 740A (Wicklow – Dublin Airport), Expressway route 2 and X2 (Wexford – Dublin), and Local Link route 389 (Courtown/Riverchapel – Gorey). The bus stops for these bus routes are a c.15min-20min walk from the subject site. Gorey Train Station, located c. 20min walk from the subject site, is served by the Dublin Connolly – Rosslare train and the DART and Dublin Commuter train. The M11 is located c. 1.3km south of the site and connects the site with Dublin city, c. 70km to the north, and Wexford town, c. 40km to the south.

The subject site is within the administrative boundary of Wexford County Development Plan 2013-2019 and the Gorey Town and Environs Local Area Plan 2017-2023 (LAP). Within this LAP the site is zoned for Residential (R), Community and Education (CE), and Open Space and Amenity (OS). The portion of the site that will provide the road access is zoned for Business and Technology Park (BTP) and Commercial (C). The undeveloped land to the south of the subject site is zoned Business and Technology Park (BTP), and Open Space and Amenity (OS).

The LAP includes a Neighbourhood Framework Plan (NFP) for five different areas within Gorey, one of which is Clonattin. The Clonattin area consists of Clonattin Upper and Clonattin Lower, which are separated by Clonattin Road, and comprises both developed and undeveloped lands. The developed lands consist primarily of residential development, but also include an industrial estate. The undeveloped lands within Clonattin comprise agricultural lands north, south and east of the developed residential area. Beyond the boundaries of the Clonattin area is further agricultural land. The Gorey Rugby Football Club and Naomh Éanna GAA club are located within Clonattin Lower at the eastern edge of the residential lands.

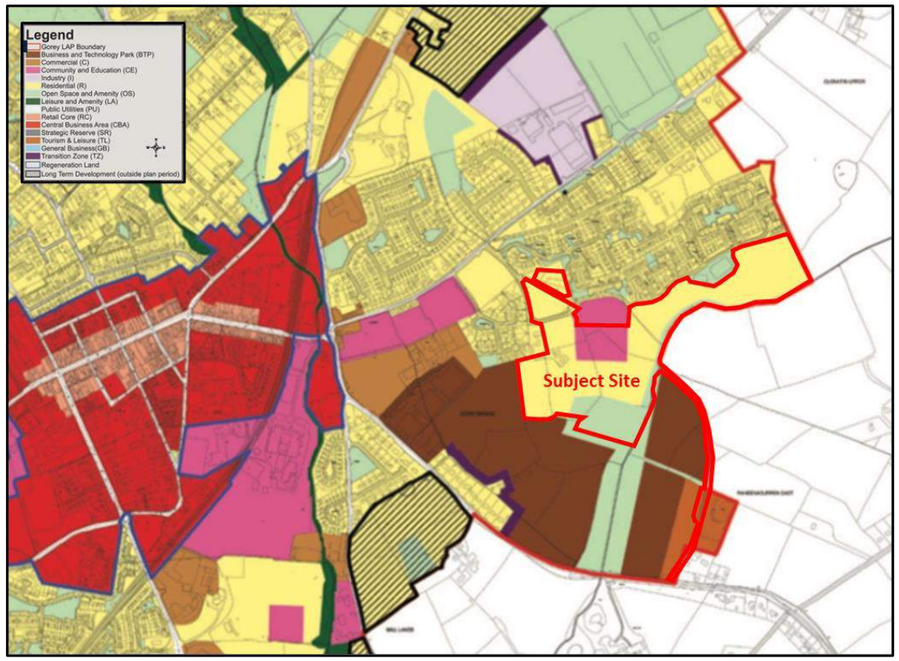


Figure 3-1 Gorey Town and Environs Local Area Plan 2027-2023 Land Use Zoning Map. Note the red line shown is for indicative purposes only. Please refer to the architects drawings for an accurate red line boundary.

Figure 3-2 Site Location. Note the red line shown is for indicative purposes only. Please refer to the architects drawings for an accurate red line boundary.

3.3 THE PROPOSED DEVELOPMENT

Demolition

The proposed development includes the demolition of two existing derelict buildings (a house and an associated shed) on site measuring a total of c. 334.27sqm. These two buildings are not of any architectural or historical merit and the principle of demolition of these buildings has been accepted by the LAP and by the planning history on the site.

Residential

The proposed development provides 363 no residential units as follows:

- 262 no. two and three storey detached and semi-detached houses (comprising 134 no. 3 beds, 124 no. 4 beds and 4 no. 5 beds);
- 11 no. three storey apartment blocks (comprising 32 no. 1 beds and 49 no. 2 beds) along with terraces of 20 no. duplex/maisonette units (10 no. 1 beds and 10 no. 2 beds) in two blocks.

Childcare Facility

The proposed creche is 513 sqm and will cater for c. 83 no. children. The creche is located to the south of the site, west of the proposed open space by the existing attenuation pond.

The creche includes 5 no. classrooms, one baby room and 4 toddler rooms, and will cater for children aged 0-5 years.

The outdoor children's play area for the creche is provided in three separate areas. A paved play area will be located to the north of the building, adjacent to the access pedestrian access into the creche site. A second paved area is provided to the south of the building which will be directly accessible from each of the toddler rooms. A third play area is located east of the building, adjacent to the large public open space. This will provide a grassy children's play area and will be clearly divided and screened from the public open space to ensure the children's safety.

Car parking is proposed adjacent to the creche and have been carefully located to minimise the impact on the public open space and the existing trees.

Site Development Works

As part of the proposed development, the two existing derelict buildings on site will be demolished. There buildings are not considered to be of significant architectural or heritage value. The principle of their demolition has been accepted previously by Wexford County Council in the granted of outline permission of a residential development on this site which also included the demolition of these buildings.

In order to facilitate the proposed development of the subject site some of the site will be reprofiled, around the proposed linear park and stream and the park around the existing attenuation tank.

The proposed development site currently has vehicular access from Clonattin Village Road to the north of the subject site. The proposal includes the creation of two crossing points over Clonattin Village Road. The proposed development will provide additional access points into the site from Clonattin Village Road. In addition, the proposed development includes the provision of a new road providing access to the east of the site from Courtown Road.

All associated site development works, drainage and infrastructural works, servicing (including substations, bin stores), landscaping, open spaces, and boundary treatment works.

Layout and Design

The layout of the proposed houses, apartment blocks and open spaces follows, as much as possible, the layout outlined in the LAP. This layout creates an irregular grid-like pattern with different blocks throughout the site.

The 10 no. different house types, the duplex apartment blocks and the 11 no. different apartment blocks have been used to create different character areas throughout the development that will help create a strong sense of place and identity. The character areas and varying house types avoids a monotonous development, will help to aid legibility, and will help create an attractive high-quality scheme. The apartment blocks are placed at strategic locations to act as nodes and to help with wayfinding throughout the development.

The streets have been designed in line with the *Design Manual for Urban Roads and Streets (2019)* to ensure a safe and pleasant environment for all road users. The blocks and streets have been laid out to avoid long stretches of road to reduce car speeds throughout the development. Many of the streets in between the blocks have been identified as homezones which will help to further reduce car speeds and create a pleasant environment for pedestrians and cyclists.

The layout has been carefully considered to ensure as many existing trees are maintained as possible. Almost all existing trees along the eastern boundary alongside Clonattin Stream will be retained. The houses in the north-east corner of the site have been set back from the site boundary to allow the existing tree line to be maintained as much as possible. The open spaces have been strategically located to allow existing trees to be incorporated into the landscaping design. Trees and hedgerows within the site that do not fall within the public open spaces will be maintained in gardens where possible.

There is a total of c. 24,098.04sqm public open space provided as part of the proposed development. This public open space is divided into six areas of public open space throughout the site.

- A large area of public open space will be located centrally within the development, on the lands zoned for Community and Education (CE). This is the largest area of public open space within the development. This open space acts as a focal point for the development and its central location ensures that the proposed units are all located close to a large area of useable open space.

- The area adjoining the existing attenuation pond in the south-east corner will be landscaped to provide an attractive and useable open space.
- A public open space provides a connection between the large central open space and the open space by the attenuation pond.
- A public open space measuring is located to the west of the site, adjacent to Block E.
- An existing playground and public open space is located to the north-east of the site, along Clonattin Road. The proposed development includes a public open space adjacent to this space, which will create a large public open space and also provides a connection to the linear park along the eastern boundary.
- A linear park is provided alongside the eastern boundary. This provides a biodiversity buffer to Clonattin stream that marks this boundary while also providing an amenity walkway for the residents of the area. This walkway connects the large open space by the attenuation pond to the open space next to the playground and provides an attractive route throughout the development.

The variety of public open spaces provided throughout the site ensures that all residents are within a short distance of the attractive, useable open space. Communal open space is provided for each of the apartment blocks as shown in the architect's drawings.

A portion of the land zoned Community and Education (CE), north of the proposed large open space, has been set aside for a potential community use, such as a school or nursing home. An indicative layout for a school is shown on these lands. This land is not included with this subject development and would be subject to a future planning application for a community use on the site as appropriate. The applicant will landscape and maintain this area until it is developed.

Figure 3-3 Extract from Reddy's Site Layout Plan

Figure 3-4 Landscaping Plan

Access and Parking

There will be five vehicular access points from Clonattin Village Road into the main site area. A sixth vehicular access from Clonattin Village Road provides access to the small portion of the site located north of Clonattin Village Road. Pedestrian access into the site is provided at each of the vehicular access points with an additional pedestrian only access located in the northeast corner of the site.

The proposed development includes a new access road to the east of the subject site. The new road will connect the site with Courtown Road to the south, through the cinema site and agricultural land. As part of this new road, a new bridge will be provided over Clonattin Stream.

The proposed development will provide a total of 690 no. car parking spaces. Car parking is provided at a rate of 2 parking spaces per house. Generally, these car parking spaces are provided within the curtilage of the houses with a small number provided as on-street parking. Car parking for the apartments and duplex units is provided communally at a rate of 1 no. spaces per unit with 33 no. visitor spaces provided. In addition, 19 no. car parking spaces are provided for the creche. 12 no. accessible car parking spaces are provided within the development.

A total of 222 no. cycle parking spaces are proposed. This includes 160 no. resident spaces and 52 no. visitor spaces for the apartments and maisonettes and 10 no. spaces for the creche. The detached, semi-detached and end of terrace houses will be able to store their bikes in their back gardens.

The car parking and cycle parking provision breakdown is shown in Table 3-1.

	Units/Sqm	Resident Car Parking Spaces	Visitor Car Parking/Set down	Resident Cycle Parking Spaces	Visitor Cycle Parking
Houses	262 no. units	524 no. spaces	13 no. spaces	-	-
Apartments	101 no. units	101 no. spaces	33 no. spaces	160 no. spaces	52 no. spaces
Creche	513 sqm	15 no. spaces	4 no. spaces	10 no. spaces	-
Total		640 no. spaces	50 no. spaces	170 no. spaces	52 no. spaces
Total		**690 no. car spaces**		**222 no. cycle spaces**	

Table 3-1 Proposed Parking Provision

3.4 CONSTRUCTION STAGE

This section of the EIAR summarises the construction of the proposed development. The preliminary Construction & Environmental Management Plan submitted separately in the planning application, and the Construction and Demolition Waste Management Plan should also be consulted.

Hoarding, Site Set-Up and Formation of Site Access/Egress

The site area will be enclosed with hoarding, details of which will be agreed with Wexford County Council. This will involve erecting hoarding around the proposed site perimeter in line with the finished development extents. Hoarding panels will be maintained and kept clean for the duration of the works.

The available site footprint will enable the Contractor to set up the site compound within the site boundary. The exact location of the construction compound is to be confirmed in advance of commencement of the works (and agreed with Wexford County Council). The site compound will be used as the primary location for the storage of materials, plants and equipment, site offices and worker welfare facilities.

The Contractor will be responsible for the security of the site. The Contractor will be required to

- Operate a Site Induction Process for all site staff;
- Ensure all site staff shall have current 'Safe Pass' cards and appropriate PPE;
- Install adequate site hoarding to the site boundary;
- Maintain site security at all times;
- Install access security in the form of turn-styles and gates for staff;
- Separate public pedestrian access from construction vehicular traffic;

The Main Contractor will be required to submit a site layout plan that will detail the proposed location of the site compound. The site compound will be used as the primary location for the storage of materials, plant and equipment, site offices and worker welfare facilities. As Project Supervisor Construction Stage (PSCS), the Contractor will be responsible for site security and they are to ensure that the site and site compound are adequately secured at all times.

As with the other construction activities that are being carried out within the Wexford County Council local authority area, activities associated with the construction compounds will be subject to restrictions to the nature and timing of operations so that they do not cause undue disturbance to neighbouring areas and communities.

The site layout plan will also include the site perimeter and the proposed detail with regards the hoarding and gate system.

Site Clearance and Demolition

The subject site is primarily a greenfield site and the development shall involve excavation and removal of material from site for foundations and regrading of the site profile. It is not envisaged that rock shall be encountered during the excavation works.

The development will also require some tree/hedge removal. The Tree Protection Plan and Tree Survey have identified the exact trees and hedges that will be removed to facilitate the development.

The subject site contains two derelict buildings – a dwelling and a shed – that will be demolished as part of the site clearance works.

A preliminary Construction and Environmental Management Plan has been prepared which will guide the site clearance and demolition phase.

It is noted that the proposed development does not propose any basements.

Car Parking Arrangements

There shall be sufficient on-site parking for staff and visitors. Construction staff shall also be encouraged to use public transport and information on local transportation shall be published on site.

Working Hours and Staff

The proposed hours of work on site will typically be 07:00 hrs to 19:00 hrs Monday to Friday and 08:00 hrs to 16:30 on Saturdays unless otherwise specified by planning conditions. Certain tasks may need to be undertaken outside of these hours. All outside of hours work will first be agreed in writing with the Local Authority.

Lighting and Services

Appropriate lighting will be provided as necessary at construction compounds. All lighting will be installed so as to minimise light spillage from the site.

Prior to any works commencing a utility survey shall be carried out to identify existing services. All services on site shall be disconnected, diverted or removed as agreed with service providers.

Delivery and Storage

Deliveries of materials to site shall generally be between the hours of 08:00 and 19:00, Monday to Friday, and 08:00 to 14:00 on Saturdays. There may be occasions where it is necessary to make certain deliveries outside these times, for example, where large loads are limited to road usage outside peak times.

The Contractor will ensure that the delivery of materials is coordinated to minimise impacts to adjacent properties. The Contractor will ensure that all materials are adequately stored and secured in their site compound. The Contractor will ensure the roads adjacent to the site are kept clean and free of debris.

Traffic Management Procedures/Generation

The contractor will prepare a site-specific Construction Traffic Management Plan (CTMP) prior to the construction works commencing. The contractor will be responsible for the implementation of all agreements between the developer and County Council with the objective that the transportation needs for the proposed development will have a minimal impact on the road network and local communities. Adequate signage as per Chapter 8 of the Traffic Signs Manual shall be installed on approach to the proposed site entrance location advising of the presence of a 'site access ahead' and 'construction traffic ahead'. The above signage shall be removed following completion of the construction phase.

The increase in traffic as a result of construction shall be minor and can be readily accommodated within the existing road network. However, the site is located in a residential area where restricted road and junction space is shared with vulnerable road users and the flow of construction traffic shall need to be marshalled and regulated to ensure that potential conflicts are avoided as much as possible.

Disposal of Water, Wastewater and Sewage

Water supply to the site shall be provided by means of a temporary connection to the public water main. Similarly, a temporary connection for foul water drainage shall be made to the public network.

Air Quality

There is the potential for a number of emissions to the atmosphere during the construction stage of the project. In particular, activities may generate quantities of dust. Construction vehicles, generators etc., will also give rise to some exhaust emissions.

A dust minimization plan will be formulated for the construction phase of the project, as construction activities are likely to generate dust emissions. The potential for dust to be emitted depends on the type of activity being carried out in conjunction with environmental factors including levels of rainfall, wind speeds and wind direction. The potential for impact from dust depends on the distance to potentially sensitive locations and whether the wind can carry the dust to these locations. The majority of any dust produced will be deposited close to the potential source and any impacts from dust deposition will typically be within several hundred metres of the construction area.

In order to ensure that no dust nuisance occurs, a series of measures will be implemented. Roads shall be regularly cleaned and maintained as appropriate. Hard surface roads shall be swept to remove mud and aggregate materials from their surface. Furthermore, any road that has the potential to give rise to fugitive dust must be regularly watered, as appropriate, during dry and/or windy conditions. Vehicles delivering material with dust potential both on and off the site shall be enclosed or covered with tarpaulin at all times to ensure no potential for dust emissions.

All vehicles exiting the site shall make use of a wheel wash facility, if required, prior to entering onto public roads, to ensure mud and other wastes are not tracked onto public roads. Public roads outside the site shall be regularly inspected for cleanliness and cleaned as necessary. Material handling systems and site stockpiling of materials shall be designed and laid out to minimise exposure to wind. Water misting or sprays shall be used as required if particularly dusty activities are necessary during dry or windy periods.

At all times, the procedures put in place will be strictly monitored and assessed. In the event of dust nuisance occurring outside the site boundary, satisfactory procedures will be implemented to rectify the problem.

The dust minimisation plan shall be reviewed at regular intervals during the construction phase to ensure the effectiveness of the procedures in place and to maintain the goal of minimisation of dust through the use of best practise and procedures.

Further information on the dust minimisation plan is included in Chapter 9.

3.5 OPERATIONAL STAGE

The proposed development is a residential development on appropriately zoned lands at Clonattin, Gorey, Co. Wexford. The development includes for a creche, a new access road, associated infrastructural works, connections and open spaces.

It is anticipated that the primary direct significant environmental effects will arise during the construction stage. Once the development is completed, and mitigation measures employed, it is expected to operate without creating any significant additional environmental impacts. The range of anticipated activities, materials/natural resources used, effects/emissions are not expected to result in a significant impact on the constituent environmental factors. The primary likely and significant environmental impacts of the operation of the proposed development are fully addressed in the EIAR document and relate to Population and Human Health, Landscape and Visual Impact, Noise and Air impacts associated with the traffic generated. There is also the potential for cumulative, secondary and indirect impacts (for instance traffic) but are unlikely to be significant and have been addressed in the EIAR.

3.6 CHANGES, SECONDARY DEVELOPMENTS, CUMULATIVE IMPACTS

The potential for the specific proposed development as described to grow is considered to be limited within the residential area. The potential for the apartments to apartments and houses to expand or increase in scale is limited to the confines of the planning permission sought and new planning permissions will be required for any extensions to the apartment blocks or houses.

The potential for any other uses such as retail, commercial, community or education would be subject to further planning permissions.

Committed Developments Within the Wider Area

There have been a number of residential developments permitted in the Gorey area in recent years.

Wexford County Council Reference: 20200467

Wexford County Council granted planning permission on the 21st August 2020 for 83 no. residential units located west of Gorey town, c. 2.5km from the subject site.

ABP Reference: 303813

An Bord Pleanála granted planning permission on the 28th May 2019 for a strategic housing development consisting of 287 no. residential units and a 225sqm creche located north of Gorey town, c. 1.5km from the subject site.

Wexford County Council Reference: 20180742

Wexford County Council granted planning permission on the 22nd August 2018 for amendments to 20170786 to provide 82 no. residential units and a creche. This site is located c. 1km south-west of the subject site.

Wexford County Council Reference: 20160823

Wexford County Council granted permission on the 9th September 2016 for 32 no. houses. This site is located north of the subject site.

These sites are not immediately adjacent to the site and do not share any boundaries with the subject site. Given the distances involved, these developments, in many instances, will not have an associated cumulative impact.

Future Development

Any future planning applications relating to the development will be assessed separately and are outside the scope of this EIAR.

4 POPULATION AND HUMAN HEALTH

4.1 INTRODUCTION

This chapter, prepared by McGill Planning Ltd., addresses the impacts of the proposed residential scheme at Clonattin, Gorey, Co. Wexford on population and human health.

4.2 METHODOLGY

To establish the existing receiving environment/baseline for the subject site, the methodology included site visits to evaluate the location and likely significant potential impact upon the human sources in the area. Desk base study included an analysis of the Central Statistics Office Census (CSO) data, the ESRI Quarterly Economic Commentary, and national, regional and local planning policy, school and creche enrolment figures.

Different local catchment areas were established for analysing population data, creche demand and capacity, and school demand and capacity. These areas were chosen to gather the most relevant data for each factor. A general local catchment area of 1km from the subject site forms the basis of most areas of analysis.

4.3 RECEIVING ENVIRONMENT

Population

For the purposes of this population analysis a local catchment area was selected to include the Electoral Divisions within 1km of the subject site. The EDs were chosen as a basis of analysis, as unlike the Small Area boundaries, the ED boundaries have remained unchanged between the two censuses and therefore can be used to compare population change over time.

The subject site is located within primarily within the Courtown ED with a portion of the site within Gorey Rural ED. The site is also only c. 130m from the border with the Gorey Urban ED.

Combined these three EDs had a population of 13,085 in 2016, an increase of 9.6% on the 2011 population for the same area. This a significantly higher population increase when compared to the national population which saw an increase of just 3.8% from 2011 to 2016. Interestingly, this population increase was not driven by urban development within Gorey town but by an increased population in Courtown ED and Gorey Rural ED. Gorey Urban ED only say a population increase of 3.1% which is in line with the national population change. However, Gorey Rural saw an increase of 11.6% and Courtown saw an increase of 13.9%. This suggests that there has been significant dispersed development in the area which is driving the population increase.

These statistics are somewhat outdated, and a new census is due to take place in 2021. The CSO provide an annual population estimate for the country and at a regional level. The 2020 population estimate suggests that the current population is c.4,977,400 and that the population for the South-East is c.439,600. The Local Area population in 2016 was 3.1% of the South-East's population. Assuming this proportion remains the same, the Local Area population for 2020 is likely to be c. 14,000. However, if the population growth seen in the Local Area between 2011 and 2016 continued, the Local Area's 2020 population is likely even higher. These estimations indicate that the state, regional and local area populations are continuing to increase.

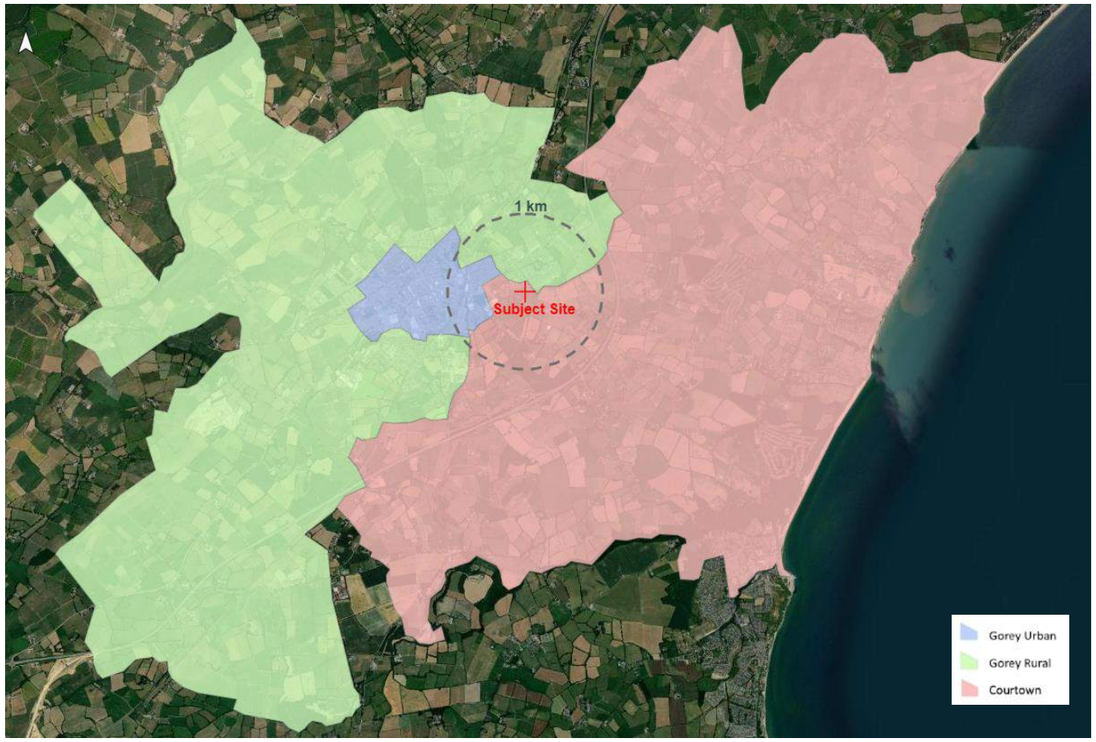


Figure 4-1 Electoral Division within 1km of the subject site.

Electoral Division	2011 Population	2016 Population	% Change
Courtown	2,317	2,639	13.9%
Gorey Urban	3,463	3,570	3.1%
Gorey Rural	6,161	6,876	11.6%
Total	11,941	13,085	9.6%

Table 4-1 Census Population Data for Electoral Division within 1km catchment area. Data Source: CSO

Area	2011	2016	% Change 2011-2016
Ireland	4,588,252	4,761,865	3.8%
Leinster	2,504,817	2,634,403	5.2%
Wexford	145,320	149,722	3.0%
Local Area	11,941	13,085	9.6%

Table 4-2 2011 and 2016 Census Data for Ireland, Leinster, Wexford and the Local Area. Data Source: CSO

Area	2016 Census	Estimated 2020 Population	% Change 2016-2020
Ireland	4,761,865	4,977,400	4.5%
South-East	422,062	439,600	4.2%
Local Area	13,085	14,000*	4.1%

*Calculated by finding 3.1% of Estimated Population for the South-East and rounding up to the nearest thousand.

Table 4-3 Estimated 2010 Populations. Data Source: CSO

Age Profile

The Local Area has a strong representation (57.9%) of working age people (20-64). This is slightly above the national 59.1% of people aged 20-64.

The Local Area's age profile has changed slightly in the period 2011-2016.

There has been a significant decrease in those aged 20-34, most notable in those aged 25-29 with a 25% decrease in this age group. These decreases are likely due to out-migration as people move away for higher education, jobs etc. The notable decrease in those aged 25-29 is also partly due to the lower number of those aged 20-24 in 2011.

There has been a slight decrease in those aged 0-4, which suggests a decrease in the number of new young families in the area. However, whether this is the start of a new trend that has continued will not be clear until the completion of the 2021 census.

There has been an increase in all other age groups between 2011 and 2016. Of particular note is the increase in those aged 65-69 which increase by 38% compared to 2011.

These population changes are illustrated in the charts below.

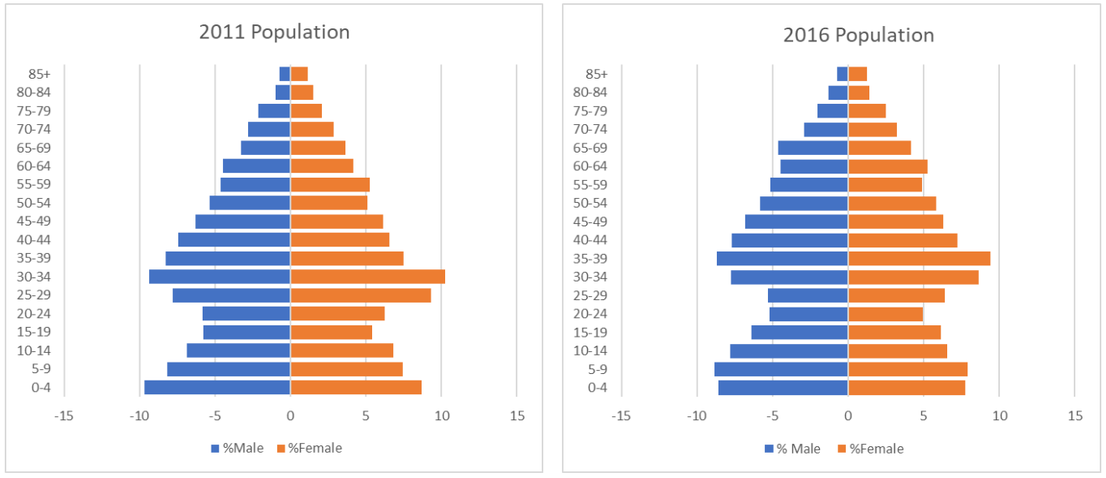


Figure 4-2 Local Area 2011 and 2016 Population Pyramids. Data Source: CSO

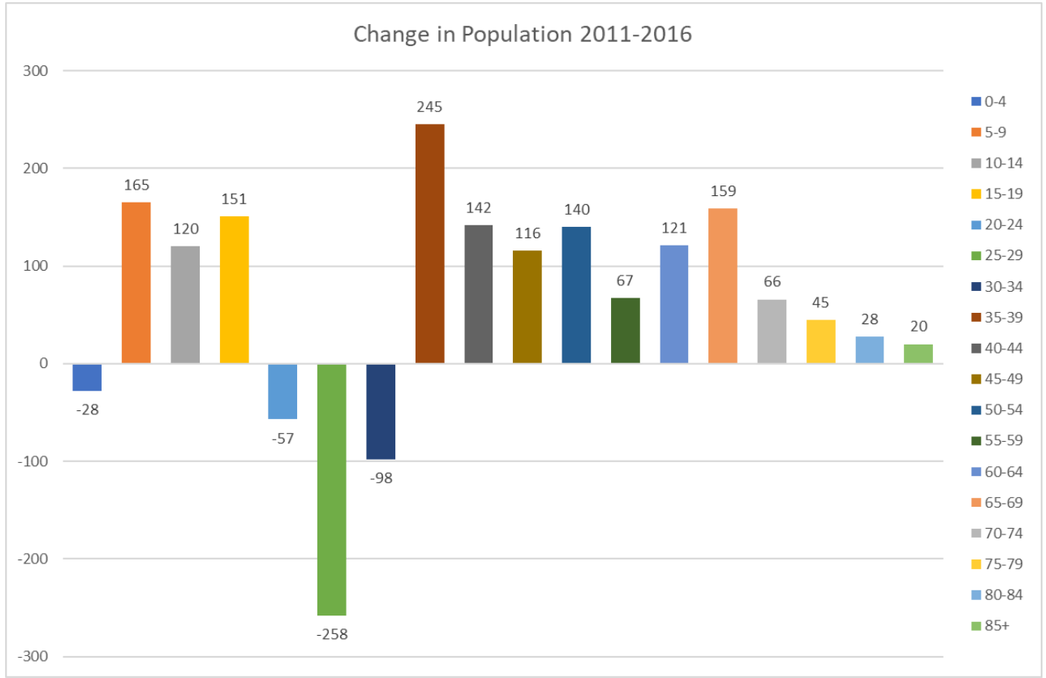


Figure 4-3 Raw Change in Population by Age Group

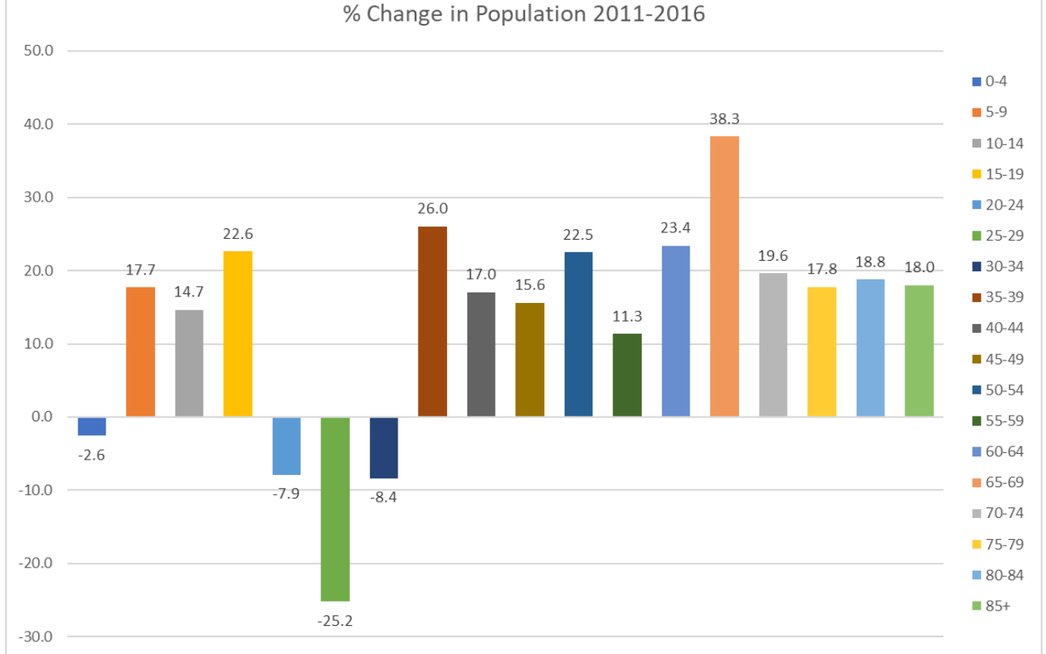


Figure 4-4 % Change in Population by Age Group

Employment

Quarterly Labour Force Survey

The CSO's Quarterly Labour Force Survey provides information in relation to national employment levels, unemployment levels and current labour force participation rates. This data usually provides a clear indication of any increase or decrease in unemployment throughout the country and economic sectors. However, the data for Q2 of 2020 has been impacted by Covid-19 pandemic and the income support schemes introduced by the government. The CSO decided to compile the Labour Force Survey estimates in the usual way, based on the International Labour Organisation (ILO) concepts and designs and to provide separate Covid-19 adjusted estimates. The Covid-19 Adjusted Measure of Unemployment was estimated by incorporating the numbers in receipt of the Pandemic Unemployment Payment with the estimated number of unemployed. The Covid-19 Adjusted Measure of Employment was estimated by subtracting those in receipt of the Pandemic Unemployment Payment from the numbers in employment.

Using the standard ILO criteria, the unadjusted unemployment rate was 5.1% in Q2 2020, which is a slight decrease on the 5.4% unemployment rate seen in Q2 2020.

Using the Covid-19 Adjusted criteria, the unemployment rate at the end of Q2 2020 was 23.1%. However, by the end of July 2020 this unemployment rate had decreased to 16.7% as sectors were able to reopen.

The standard ILO criteria indicated an annual decrease in employment of -3.4%. This compares with an annual increase of 2.2.% in the previous quarter. The Covid-19 adjusted criteria indicated a decrease in employment of -21.5%.

Employment decreased in 7 of the 14 economic sectors over the year. The largest decrease was recorded in the *Accommodation and Food Service Activities* sector which saw a decrease of 29.6%. Employment increased in 6 of the 14 economic sectors. The largest increase was seen in the *Financial, Insurance and Real Estate Activities* which saw an increase of 1%.

The two tables below show the employment data for Q2 2018, Q2 2019, and Q2 2020 based off the ILO criteria and the Q2 2020 data adjusted for Covid-19.

ILO Economic Status	Q2 2018	Q2 2019	Q2 2020	Annual Change	
All Persons				2019-2020	%
In Labour Force	2,399,300	2,420,800	2,341,200	-79,600	-3.3
In Employment	2,255,000	2,300,000	2,222,500	-77,500	-3.4
Unemployed	144,300	130,800	118,700	-12,100	-9.3
Not in Labour Force	1,448,900	1,481,800	1,631,700	149,900	10.1
Total Persons aged 15 or over	3,848,300	3,912,600	3,973,800	61,200	1.6
Unemployment Rate	6.0%	5.4%	5.1%		

Table 4-4 Employment Data - ILO Criteria

ILO Economic Status	Q2 2018	Q2 2019	Q2 2020 Covid-19 Adjusted	Annual Change	
All Persons				2019-2020	%
In Employment	2,255,000	2,300,00	1,783,567	-516,433	-21.5
Unemployed	144,300	130,800	531,412	400,612	306.3
Unemployment Rate	6.0%	5.4%	23.1%		

Table 4-5 Employment data - Q2 2020 Adjusted for Covid-19

2016 Census Employment Data

The most recent employment data for the Local Area is from the 2016 Census. According to this data, 50% in the Local Area were employed in 2016, 10% were unemployed and 14% were retired. In terms of economic sectors, Commerce and Trade was the largest sector (24.8%), followed by Other (21.5%) and Professional Services (21.8%). In terms of occupation, 15.8% in the Local Area were employed as Skilled Trade Occupations and 12.9% were in professional occupations.

According to the 2016 Census data for the Local Area, 67% of those travelling to work or school had a commute time of less than 30 min, while 13% had a commute time of over 1 hour.

This data for the Local Area is now significantly out-of-date. It does not capture the economic growth seen in the period following the 2016 census until Q1 2020 or the impact of the Covid-19 pandemic.

Childcare

Desktop research was carried out analysing information provided by Pobal and Wexford County Childcare Committee. A catchment area comprising a 1km buffer area from the subject site was chosen as the basis for analysing the childcare provision in the area.

Pobal, the government agency, maintains an up to date map of registered childcare facilities within Ireland, enabling more objective analysis of gaps in provision and the targeting of areas where facilities may be needed in the future. An analysis of the Pobal data shows that there are 12 no. childcare facilities within Gorey, 6 no. of which are within 1km of the subject site. 3 no. of those within 1km are currently within a 15-minute walk of the subject site.

These 12 no. childcare facilities are listed in the table below and mapped in the figure below.

	Childcare Facility	Address	Distance from Subject Site*
1.	1, 2, 3, Academy Pre-School and Montessori	3 Clonattin Village, Gorey	c. 330m
2.	C.I.L.A. Children's Service	St. Aidan's Service, Milands, Gorey	c. 700m
3.	Erika's Montessori Playschool	Castlerock Clonattin Lower, College Road, Gorey	c. 900m
4.	Small Wonders	Courtown Road, Gorey	c. 550m
5.	Caroline's Little Treasures	Courtown Road, Gorey	c. 760m
6.	Little Daises Community Childcare	Gorey Youth and Community Childcare, Mary Ward Lane, St. Michaels Road, Gorey	c. 950m
7.	St. Clemens's Community Playschool Ltd	Grattan Terrace, Gorey	c. 1.1km
8.	Giant Steps Montessori	Christ Church Old School, Charlotte Row, Gorey	c. 1.6km
9.	Higgy's House	Ramsgate Village, Gorey	c. 1.7km
10.	Little Oaks Academy	Oakwood Estate, Ramstown, Gorey	c. 2km
11.	Little Lambs Montessori and Creche	49 Ardmore Carnew Road, Gorey	c. 2.4km
12.	Little Crickets Creche and Montessori	145 Pearson's Brook, Holyfort Road	c. 2km
*Distance measured from approximate centre of subject site			

Table 4-6 Childcare Facilities in Gorey

The 2016 census data for the Local Area indicates that 8.2% of the local area were aged 0-4 in 2016. This is a slight decrease from the 9.2% aged 0-4 in 2011.

Electoral Division	2016 Total Population	Population Aged 0-4	% Population Aged 0-4
Gorey Urban	3,570	230	6.4
Gorey Rural	6,876	678	9.9
Courtown	2,639	160	6.1
Total (Local Area)	7,582	1,068	8.2

Figure 4-5 Childcare Facilities within vicinity of subject site

Schools

Desktop research of the schools in the area was carried out using the available information from the Department of Education and Skills and Google Maps.

Within 1km of the subject site there is one primary school: Bunscoil Loreto, and one post primary school: Gorey Community School. These two schools are just beyond a 15-minute walk of the subject site. There are a further 4 primary schools and 1 post-primary school within Gorey that will also serve the subject site.

Figure 4-6 Location of Primary and Post Primary Schools in Gorey

The Department of Education provides enrolment information for all primary and post primary schools in the country. The 2019/2020 enrolment figures for the schools in the area are shown in the tables below.

Primary Schools	Gender	2019/2020 Enrolment
Bunscoil Loreto	Mixed	699
Gorey Central School	Mixed	218
St. Joseph Primary School	Mixed	504
Gorey Educate Together National School	Mixed	416
Gaelscoil Moshíológ	Mixed	220
Post-Primary School	**Gender**	**2019/2020 Enrolment**
Gorey Community School	Mixed	1,538
Creagh College	Mixed	821

Table 4-7 Primary and Post Primary School Enrolment

Health

The surrounding context of the site consists of a mix of residential, community and amenity related land uses. It does not include any man-made industrial sites or processes (including SEVESO II Directive sites) that would be likely to result in a risk to human health and safety.

4.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed development consists of a residential development as described in the chapter 3 of this EIAR and the statutory notices.

4.5 POTENTIAL IMPACTS

Impact on Business and Residences

Construction Phase

The construction of the proposed development is likely to have a positive effect on the local employment and economic activity. The development in the short term (5 years maximum) will provide for construction related employment during the different phases of development. In addition, the construction phase will see increased spending in the local area by construction workers and those associated with the construction phase of development.

Businesses directly involved in the construction phase of the development would generate value and secure direct employment which in turn will contribute to the overall GDP of the economy and tax revenues.

Operational Phase

The proposed development will provide 363 no. residential units. Considering the national average household size of 2.7 people, this development will likely generate a population of c. 980 no. people when fully occupied.

Considering the number of people in employment in the local area (50%), it can be expected that c. 490 no. of the population generated will be working. This increase in the local employment population will contribute positively to local businesses and amenities, while also improving the vibrancy and vitality of the area and the community.

Impacts on Human Health

Construction Phase

The construction phase of the proposed development may give rise to short term (less than 5 years) impacts to the locality such as, construction traffic and surface contaminants, dust, exhaust emissions, noise and littering. Other impacts may include increased traffic due to hauling of building materials to and from the proposed development site, which are likely to affect adjacent population. The construction impacts are dealt with in the relevant chapters of this EIAR document. Where possible potential risks will be avoided from design.

Operational Phase

The operational stage of the development is unlikely to cause any adverse impacts on the existing and future residents of the locality in terms of human health. The design of the development has been formulated to provide for a safe environment for the future residents and visitors alike. The paths, roadways and public realm have been designed in accordance with the best practice and applicable guidelines. All open areas have been designed to be inviting, safe and conveniently located.

Impacts on Air Quality and Climate

Construction Phase

The construction associated with the development will cause disturbances to the site and the locality to a certain extent. The likely impacts from the disturbance includes dust emissions from moving heavy machinery and construction traffic. If not properly mitigated this has the potential to impact the surrounding population and human health.

Due to the extent of works on the site the increase in exhaust emissions will be a short-term effect and will not have any significant detrimental impacts to the air quality. The potential of an increase in exhaust emissions and dust release into the atmosphere will be managed through a Construction and Environmental Management Plan. Waste generated during and after the construction phase will be dealt with in a Construction and Demolition Waste Management Plan. Any impacts to the existing population and health will be adequately addressed and mitigated.

Operational Phase

During the operational phase of the development it is susceptible that there will be a slight reduction in air quality with the growth of population on site and associated increase in the vehicular traffic. Emissions from living conditions such as heating, and kitchen may also contribute to the small increase in localised emissions.

The completion and operation of the development will also see the landscaped areas within the site establishing and maturing. Plants, trees and other landscaping elements will lead to the absorption of Carbon Dioxide from the atmosphere and releasing Oxygen back. These effects are discussed in detail in Chapter 9 - Air Quality and Climate. Any effects due to the development during the operational phase is not anticipated to be of significant impact to the existing or expected population of the locality.

Impacts on Childcare

Construction Phase

During the construction phase, the childcare facilities within close vicinity of the subject site will be temporarily impacted by construction noise, traffic and dust. The 1, 2, 3, Academy Pre-School and Montessori is the childcare facility most likely to be negatively impacted by the construction phase. Although negative, this impact will be minor, mitigated and will only continue for the construction period.

Operational Phase

The analysis of the 2016 population data for the local area shows that c. 8.2% of the local area population is aged 0-4. The proposed development of 363 no. residential units will likely result in a 0-4 aged population of c. 80 no. children.

	Total Population	Population Aged 0-4	% Aged 0-4
Local Area 2016 Population	7,582	1,068	8.2
Proposed Development Projected Population	980	80	8.2

This projected increase in the local area's 0-4 aged population will result in increased demand for childcare facilities. Therefore, a creche will be provided as part of the development to serve both the development's future population and the local area. The proposed creche will cater for c. 83 no. children and will be located to the south of the site.

Based on the 2001 Childcare Guidelines and the 2018 Apartment Guidelines, the proposed development is likely to generate a demand for c. 97 no childcare spaces (20 no. spaces per 75 unit) or 86 no. spaces if all one beds are excluded. Therefore, considering the existing provision in the area and the fact that not every child will require private childcare, the proposed creche is considered an appropriate size to serve the proposed development.

Impacts on Schools

Construction Phase

During the construction phase of development there will be minimal impact on the surrounding schools. The school will be temporarily negatively impacted by construction noise and dust. However, any negative impact will be of short duration and will be mitigated appropriately.

Operational Phase

The 2016 census indicates the share of population in the Primary School (4-11) and Post-Primary School (12-18) years. This percentage share was used to estimate the number of primary and post-primary school children the proposed development would generate.

An analysis of the 2016 Census data shows that the total population for the local area was 7,582 no. people, of which 1,667 no. were of primary school age and 1,063 no. were of post-primary school age. This equates to approximately c. 12.7% and 8.1% respectively.

Local Area – 2016	Number	% of Total 2016 Population
Primary School Age (5-12)	1,667	12.7%
Post-Primary School Age (13-18)	1,063	8.1%
Total Population	7,582	100%

The national household size, according to the 2016 census, is 2.7 people. The proposed residential development contains 363 no. units and will have an expected population of c. 980 no. when mature. Using the percentages explained above, the estimated maximum primary school going population that would be generated by the development is c. 124 and c. 79 no. students for post-primary.

	Proposed Development Projected Population
Total Population	980
Primary School Age (4-11)	124
Post-Primary School Age (12-18)	79

However, the proposed development will not generate this level of demand instantly given that the development will initially be occupied by those predominately in the either early family cycle (e.g. young, singles, newlyweds), empty nesters or young professionals. Initially the demand will be for childcare mainly. Over the course of approximately 10 years primary school demand will gradually increase and then secondary school demand will follow incrementally.

In addition, the enrolment levels in schools change over time and national enrolment projections estimate decreasing enrolment numbers first at primary school and 5 years later at post primary school. These national projections are carried out by the Department of Education and Skills.

The Department of Education published *Projections of Full-Time Enrolment Primary and Second Level 2018-2036* in July 2018 which outlined 4 possible scenarios for the future enrolment in schools. Enrolment projections show that primary school enrolment numbers reached their peak in 2018 and that a continuous decline in enrolment until 2036 is expected. The projected enrolment for post-primary schools is not expected to peak until 2024 or 2025, which is then expected to be followed by a continuous decline until 2036.

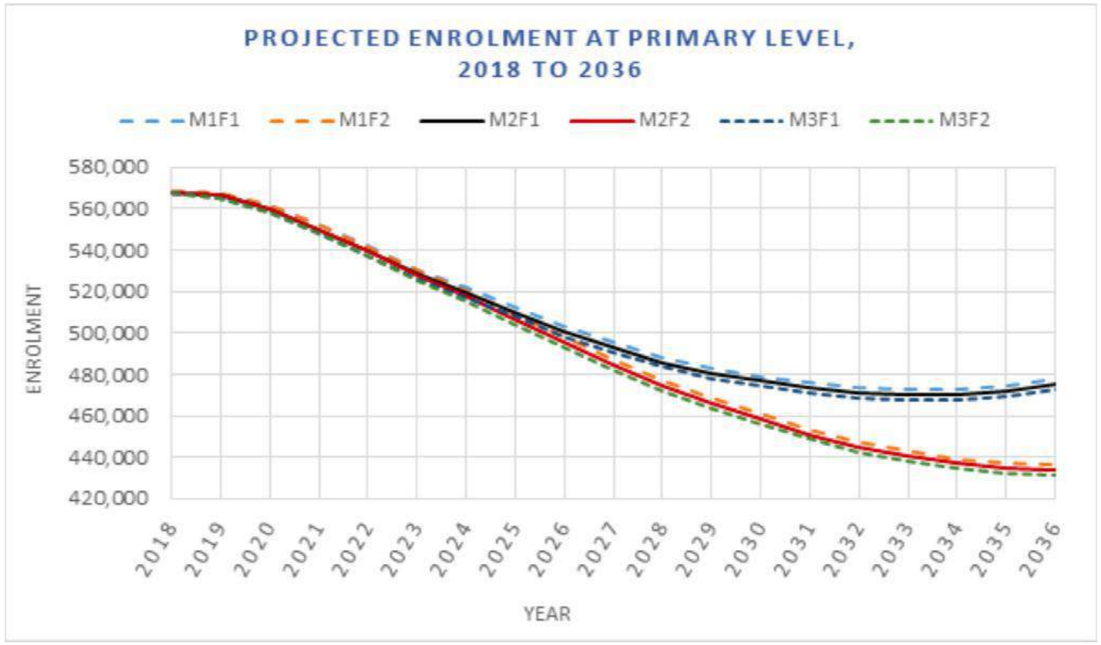


Figure 4-7 Projected Primary School Enrolment. Source: Dept. of Education and Skills

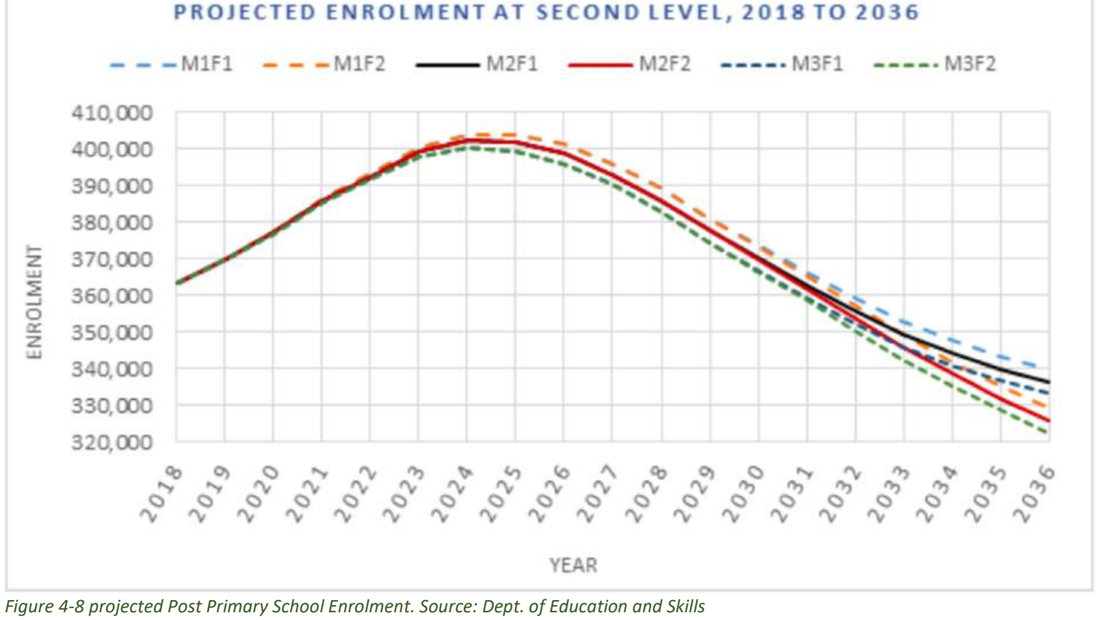


Figure 4-8 projected Post Primary School Enrolment. Source: Dept. of Education and Skills

Following these projections, it can then be assumed that the increase in primary school aged children caused by the development is likely to be lower than expected and will level out in the near future and will not continue to increase into the future.

4.6 POTENTIAL CUMULATIVE IMPACTS

Overall, the cumulative impacts of the proposed development on the population and human health are envisaged to be positive. The significant new population will contribute to the economic viability of the area with increased spending. The new open spaces will add to the viability and vibrancy of the area. The existing services and facilities will tap into the expanding population and invest more. Schools, Buses, shops etc. will benefit from the increase in population.

4.7 MITIGATION MEASURES

Construction Phase

A preliminary Construction and Environmental Management Plan (CEMP) has been prepared by the CS Consulting Engineers and will be implemented during the construction phase to reduce the detrimental effects of the construction phase on the environment and local population. The CEMP will be formally agreed in writing with the planning authority in writing prior to the commencement of the development (the preliminary CEMP is included with this application for reference). Other items to be mitigated during the construction phase are discussed further under various environmental topics discussed in the chapters following. These measures are put forward to avoid any significant negative environmental impacts on the population and human health.

Operational Phase

The proposed development has been designed to avoid negative impacts on population and human health through the provision of various physical and social infrastructure as part of the development as are outlined in Chapter 3 of this EIAR. No addition mitigations measures are considered necessary.

4.8 PREDICETED IMPACTS

Construction Phase

Any adverse likely and significant environmental impacts will be avoided by the implementation of the remedial and mitigation measures proposed throughout this EIAR. Positive impacts are likely to arise due to an increase in employment and economic activity associated with the construction of the proposed development. The overall predicted likely and significant impact of the construction phase will be short-term, temporary and neutral.

Operational Phase

The proposed development will contribute to further growth and expansion of the neighbourhood contributing to the existing and future populations. The predicted impacts of the Operational Phase are considered to be long term and positive to population and human health.

4.9 'DO NOTHING' SCENARIO

A 'do nothing' scenario will result in the subject site remaining undeveloped.

4.10 WORST CASE SCENARIO

The worst-case scenario for the development will be a situation where the development is only partially completed.

4.11 MONITORING & REINSTATEMENT

The monitoring measures required for the aspects of water, air quality and climate, noise, landscape and visual impact, etc provides an appropriate response in this instance.

4.12 DIFFICULTIES IN COMPILING INFORMATION

As outlined above, there were two minor limitations in compiling the population data.

- The census data that informed this chapter's analysis dates from 2016, which could be considered out of date.
- This analysis was carried out during the Covid-19 pandemic and it is not yet clear what short term or long-term impacts will have on local populations, particularly in relation to employment and childcare needs.

Despite these limitations to the data collection, every effort was made to ensure that the data collected and analysed was as accurate as possible.

It is also worth noting that the 15 minute walking distance used throughout this chapter is based on the existing road network. Once the proposed development is complete, residents will also be within a short walking distance of Courtown Road.

4.13 REFERENCES

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5 BIODIVERSITY

5.1 INTRODUCTION

The Biodiversity assessment has been undertaken by Altemar Limited. It assesses the biodiversity value of the proposed development area and the potential impacts of the development on the ecology of the surrounding area and within the potential zone of influence (ZOI). Standard construction and operational phase control measures, in addition to monitoring measures are proposed, to minimise potential impacts of the proposed development and to improve the biodiversity potential of the proposed development site post construction.

The programme of work in relation to biodiversity assessment was designed to identify and describe the existing ecology of the area and detail designated sites, habitats or species of conservation interest that could potentially be impacted by the proposed development. It also assesses the significance of the likely impacts of the scheme on the biodiversity elements, and designs mitigation measures to alleviate identified impacts. Full details of all the mitigation measures of the project are contained in the accompanying Construction Environmental Management Plan (CEMP).

A separate AA Screening, in accordance with the requirements of Article 6(3) of the EU Habitats Directive, has been produced to identify potential impacts of the development on Natura 2000 sites, Annex species or Annex habitats. It concludes that "*No Natura 2000 sites are within the zone of influence of this development. Having taking into consideration the effluent discharge from the proposed development works, the distance between the proposed development site to designated conservation sites, lack of direct or indirect hydrological pathway or biodiversity corridor link to conservation sites and the dilution effect with other effluent and surface runoff, it is concluded that this development that would not give rise to any significant effects to designated sites. The construction and operation of the proposed development will not impact on the conservation objectives of features of interest of Natura 2000 sites*."

Background to Altemar

Altemar Ltd. is an established environmental consultancy that is based in Greystones, Co. Wicklow that has been in operating in Ireland since 2001. Bryan Deegan MCIEEM is the Managing Director of Altemar Ltd. and holds a M.Sc. Environmental Science, BSc (Hons.) in Applied Marine Biology and a National Diploma in Applied Aquatic Science. He has over 26 years' experience as an environmental consultant in Ireland and was the ecologist for all aspects of this project. Previous projects where Altemar were the lead project ecologists include the Lidl Ireland GmbH regional distribution centres in Newbridge and Mullingar, 18 airside projects for daa at Dublin Airport and 7 fibre optic cable landfalls in Ireland including the New York to Killala cable project in 2015. Altemar are the sole external consultant acting as "environmental expert" to Inland Fisheries Ireland.

5.2 METHODOLGY

Desk study

A desk study was undertaken to gather and assess ecological data prior to undertaking fieldwork elements. Sources of datasets and information included:

- The National Parks and Wildlife Service
- National Biological Data Centre
- Satellite, aerial and 6" map imagery

A provisional desk-based assessment of the potential species and habitats of conservation importance was carried in July 2019 and reviewed again in August 2020. Altemar assessed the project, the proposed construction methodology and the operation of the proposed development. It was determined that the proposed development had the potential to impact beyond the site outline and into the surrounding environment as a result of the proposed works, in the absence of mitigation measures. Works proposed include instream works including culvert installation.

Field Survey

Field surveys were carried out by Altemar Ltd. on the 29th September 2019, 28th September 2020 and the 1st October 2020, following completion of the desk-based assessment. Site visits were carried out by Bryan Deegan in relation to flora, fauna and included two bat emergent/detector surveys (29th September 2019 & 1st October 2020). Surveys were carried out in mild dry conditions and covered all the lands within the site outline and the land immediately outside the site. The purpose of the field survey was to identify habitat types according to the Fossitt (2000) habitat classification and map their extent. In addition, more detailed information on the species composition and structure of habitats, conservation value and other data were gathered.

Survey Limitations

The field surveys were carried out in September 2019, September 2020 and October 2020. This is within, but towards the end of, the period for full species assessments of the floral cover and bat surveys. Weather conditions were mild and dry and allowed a bat detector survey to take place. However, September and October are suboptimal season to observe terrestrial mammal activity.

Spatial Scope and Zone of Influence

Zone of Influence (ZoI) is the 'effect area' over which changes could give rise to potentially significant impacts. In order to define the extent of the study area for ecological assessment, all elements of the project were assessed and reviewed in order to identify the spatial scale at which ecological features could be impacted. The project would involve in stream works, excavations and construction, which may impact beyond the site through noise, dust, light and downstream impacts. Standard construction phase controls will need to be implemented to limit the potential impact of the proposed development into the surrounding environment including measures to protect from downstream impacts from the instream works in the Clonattin Stream/River and drainage ditch crossings. The potential ZOI of the construction phase of the project was deemed to be the site within the site outline, nearby sensitive receptors including the Clonattin Stream/River which borders the site with potential for downstream impacts. However, the ZOI of the operation of the proposed development would be the immediate area of the proposed development site.

5.3 RECEIVING ENVIRONMENT

The location of Natura 2000 sites (SAC's and SPA's) within 10km of the proposed development are seen in Figures 5-1 to 5-3. National designated conservation sites within 5km (pNHA & NHA) of the proposed development are seen in Figure 5-4. Details of National and international conservation sites within 10km of the proposed development are seen in Table 5-1. All conservation sites beyond 5km do not have a direct hydrological pathway. Several conservation sites beyond 5 km are located beside or within the marine environment, which is 4km from the proposed development. Due to the distance and dilution and mixing in the marine environment, no significant effects would be seen on conservation sites beyond 10km.

Name		Direct Pathway	Distance (km)	Type
IE004143	Cahore Marshes	No	13.5	SPA
IE000781	Slaney River Valley	No	4.0	SAC
IE001742	Kilpatrick Sandhills	No	9.1	SAC
IE000700	Cahore Polders and Dunes	No	13.9	SAC
000757	Courtown Dunes And Glen	Yes (hydrological)	3.5	pNHA
000745	Ballymoney Strand	No	4.4	pNHA
001834	Kilgorman River Marsh	No	7.6	pNHA
001742	Kilpatrick Sandhills	No	9.5	pNHA
001733	Ardamine Wood	No	6.3	pNHA
001737	Donaghmore Sandhills	No	9.0	pNHA
000702	Leskinfere Church, Clogh	No	5.6	pNHA

Table 5-1 Conservation sites within 10km of the proposed site.

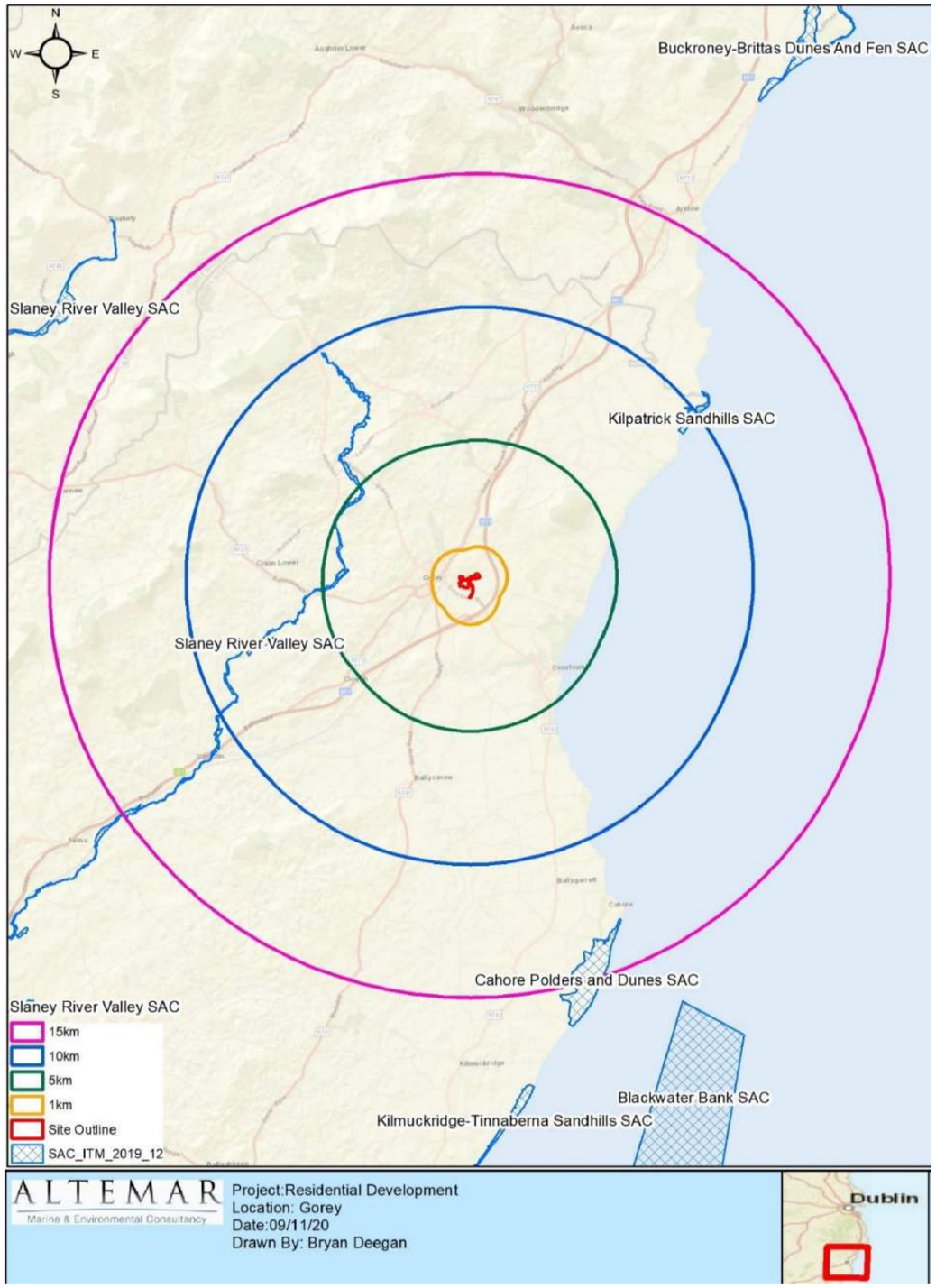

Figure 5-1 Special Areas of Conservation within 15km of the proposed development.

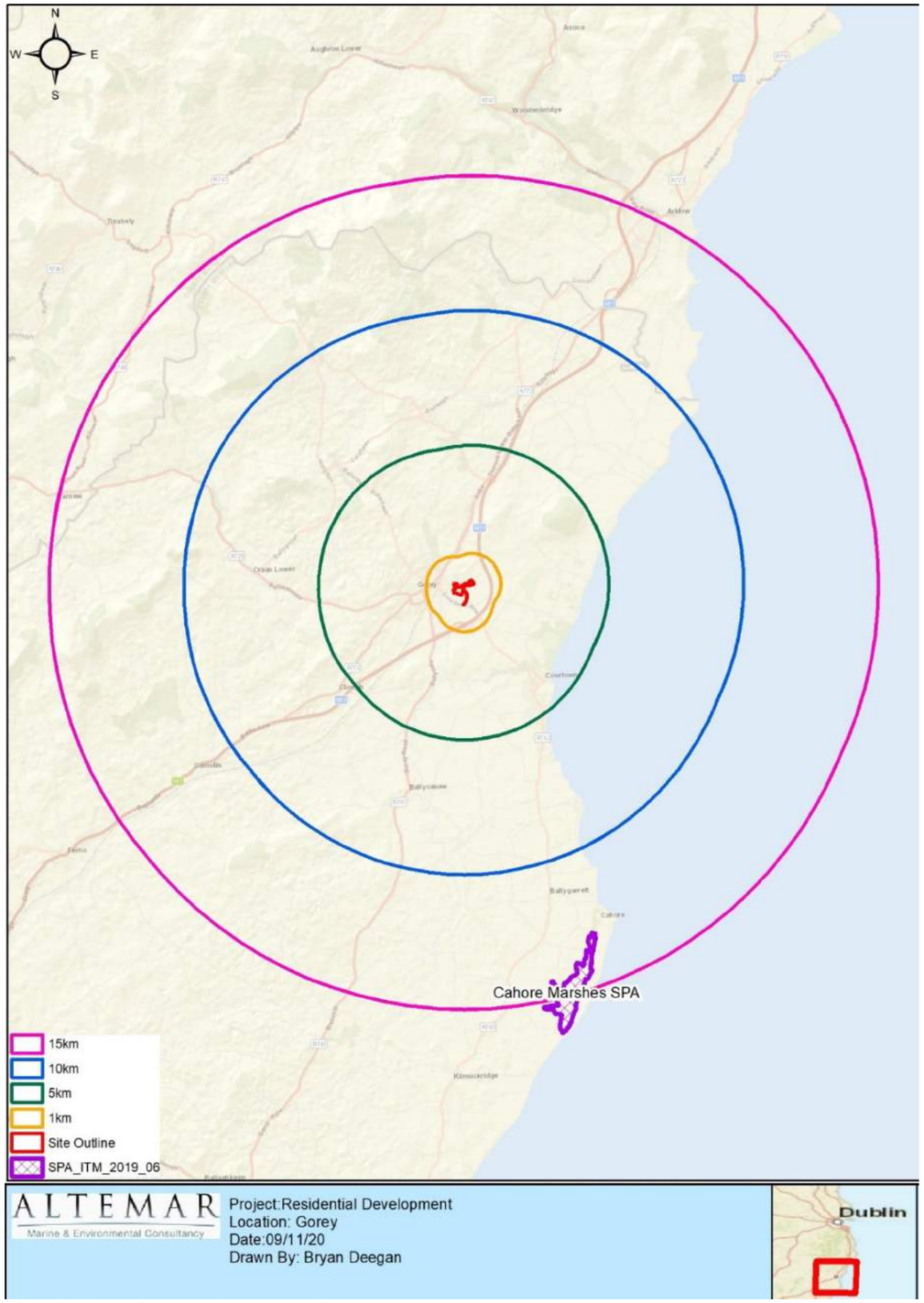

Figure 5-2 Special Protection Areas within 15km of the proposed development.

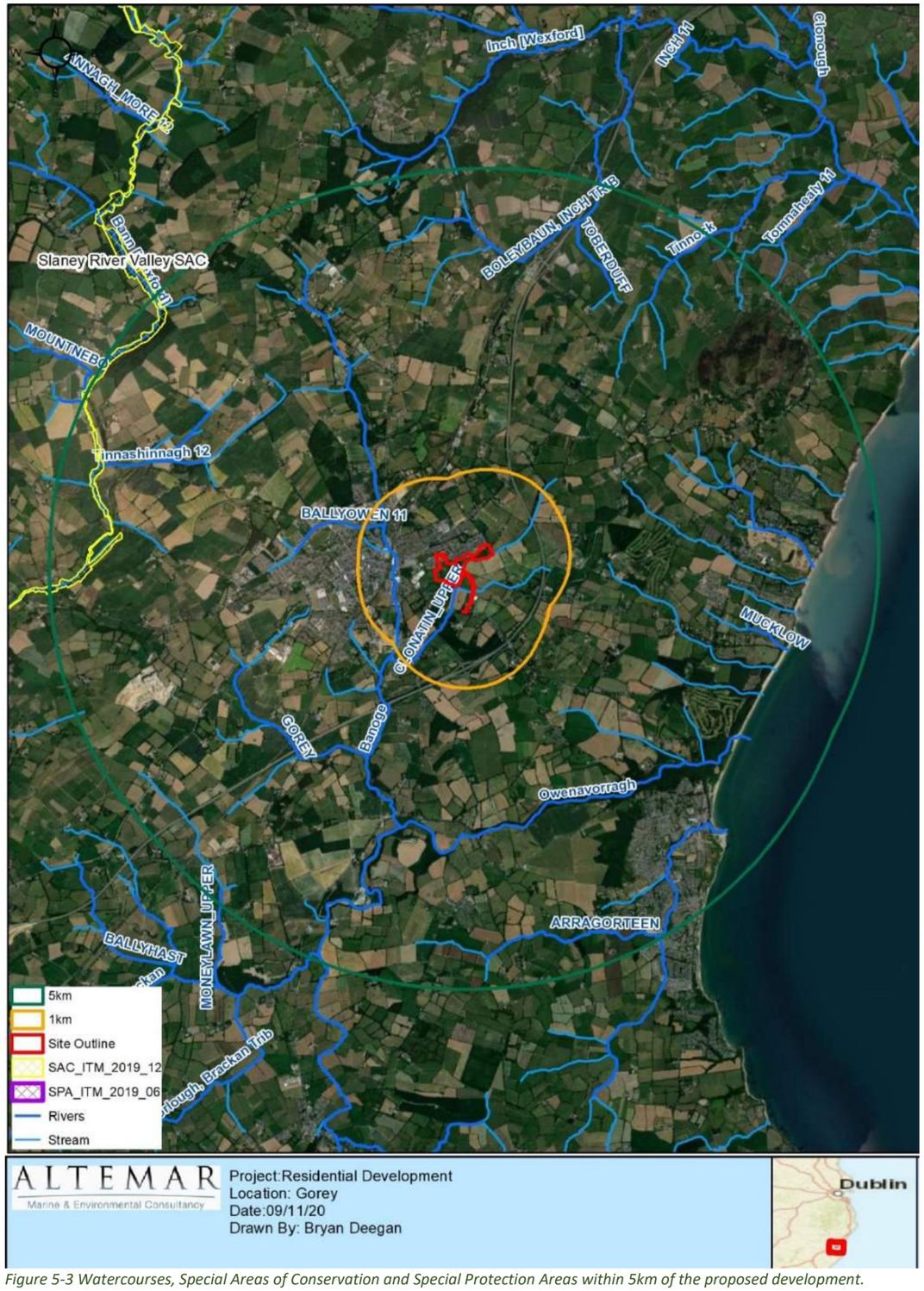

Figure 5-3 Watercourses, Special Areas of Conservation and Special Protection Areas within 5km of the proposed development.

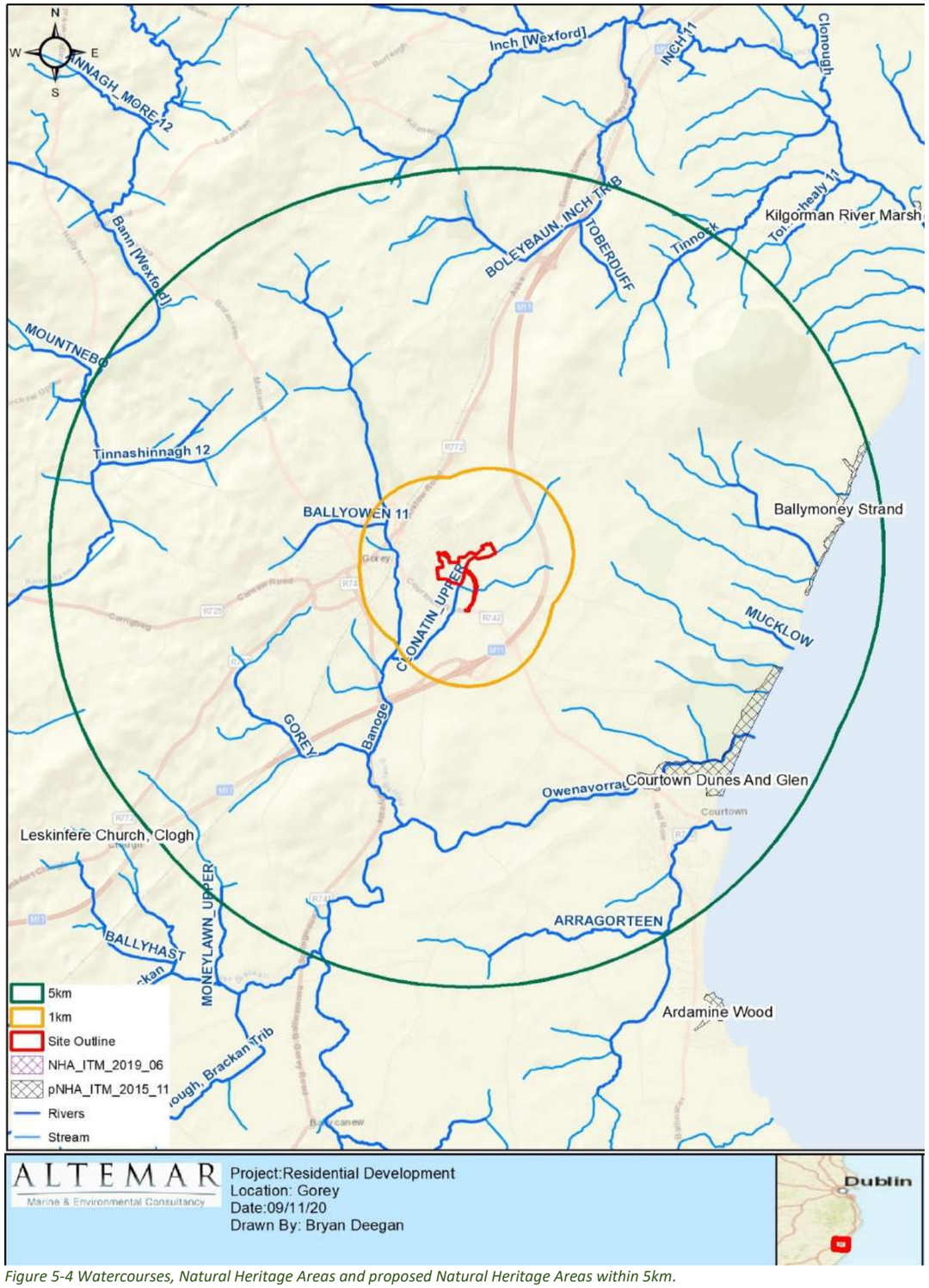

Figure 5-4 Watercourses, Natural Heritage Areas and proposed Natural Heritage Areas within 5km.

5.4 HABITATS AND SPECIES

Habitats within the proposed site outline were classified according to Fossitt (2000) (Figure 5-5) and species assessments were carried out:

BL3 Buildings and artificial surfaces

Several buildings were present on site. A derelict house (Plate 1), a metal barn and what appeared to be a pumphouse was located near the attenuation pond. As is seen in Appendix I a bat emergent survey was carried out in the vicinity of these buildings and 3 bats were observed emerging from house on site. A derogation Licence has been sought from NPWS.

Plate 5-1 Derelict house.

GA1-Improved agricultural grassland

Improved agricultural grassland is located in the central portion of the site. The fields appear to have been unmanaged for several years and are suffering from scrub encroachment from the edges of the fields (Figure 10). The fields were dominated by thistles (*Cirsium arvense, C. vulgare*), common ragwort (*Senecio jacobaea*), creeping buttercup (*Ranunculus repens*), dandelion (*Taraxacum spp*.), docks (Rumex spp.), common vetch (*Vicia sativa*), daisy (*Bellis perennis*), clover (*Trifolium repens*), plantains (*Plantago spp*.), nettle (*Urtica dioica),* lesser stitchwort *(Stellaria graminea)* and rushes (*Juncus* spp). Several goldfinch (*Carduelis carduelis*) were noted feeding on seedheads of thistles.

Plate 5-2 GA1-Improved agricultural grassland

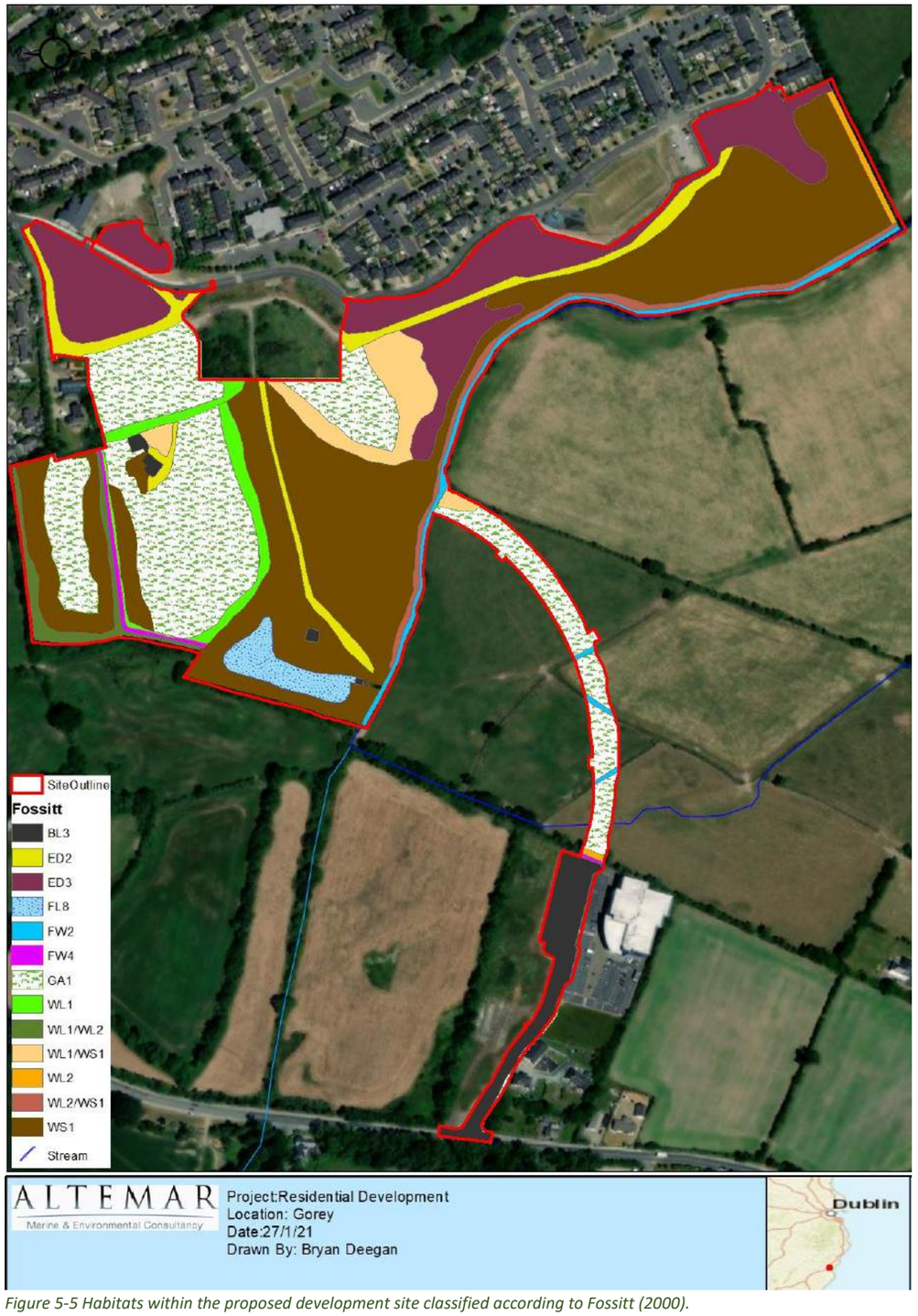

Figure 5-5 Habitats within the proposed development site classified according to Fossitt (2000).

(See the Habitat descriptions below for an explanation of the Fossitt Codes)

WS1-Scrub

As seen from Figure 10 Scrub dominated much of the eastern portion of the site. It is likely that this area has undergone significant site clearance in the past as areas of rubble were present across the eastern portion of this habitat. Species within the scrub area include trees such as willows (*Salix spp.),* ash (*Fraxinus excelsior*), elder (*Sambucus nigra*), and sycamore *(Acer pseudoplatanus).* Other species included, butterfly-bush (*Buddleja davidii*), rosebay willowherb (*Epilobium angustifolium*), common ragwort (*Senecio jacobaea*), thistles (*Cirsium arvense & C. vulgare*), docks (*Rumex spp*.), hedge bindweed *(Calystegia sepium), coltsfoot (Tussilago farfara*), bulrush (*Typha latifolia*), rushes (*Juncus sp.*), dog-rose (*Rosa canina*), dandelion (*Taraxacum spp*.), docks (*Rumex spp*.), ivy (*Hedera helix*), common nettle (*Urtica dioica*), montbretia (*Crocosmia x crocosmiiflora*), Great Willowherb (*Epilobium hirsutum*) and bramble (*Rubus fruticosus agg*.). On the western portion of the site the dominance of willow scrub was replaced by Gorse (*Ulex europaeus*) scrub with areas of bracken (*Pteridium aquilinum*), with willow again in the vicinity of the attenuation pond. The buffer with the Clonattin Upper stream has a mixture of treelines and scrub. The treelines in this area extent to both sites of the stream with a more scrub appearance on the northern and western portion. This area would be seen as ecologically locally important as there are several mature oak (*Quercus sp.*) ash (*Fraxinus excelsior*), holly (*Ilex aquifolium*) and sycamore (*Acer pseudoplatanus*) along the eastern boundary of the stream. A 10m riparian buffer is proposed in this area and it would be necessary to implement a protection area along this buffer to maintain biodiversity but, also to mitigate potential downstream impacts on the Clonattin Stream and River.

Plate 5-3 WS1-Scrub

FL8-Other Artificial ponds and Lakes

On the southern portion of the site is a large attenuation pond for the neighbouring and proposed development. The outlet of this pond feeds the Clonattin River. The pond is fed by the site drainage from the development but also a drainage ditch which passes within the hedgerow to the west of the derelict house. This pond has become well established. Species in the area included yellow flag (*Iris pseudacorus*), bulrush (*Typha latifolia*), rushes (*Juncus sp*.), mater mint (*Mentha aquatica*), meadowsweet (*Filipendula ulmaria*), lesser duckweed (*Lemna minor*), and horsetails (*Equisetum sp*.), with a willow (Salix spp) based scrub (as above) around its perimeter. It should be noted that the only protected species recorded within the NPWS rare and protected species data within the proposed development site was the common frog (*Rana temporaria*) which was in the vicinity of the drainage ditch that feeds the pond. Daubenton's bats (*Myotis daubentonii*) were noted foraging over the pond during the bat survey and therefore this area would be seen to be sensitive to lighting impacts.

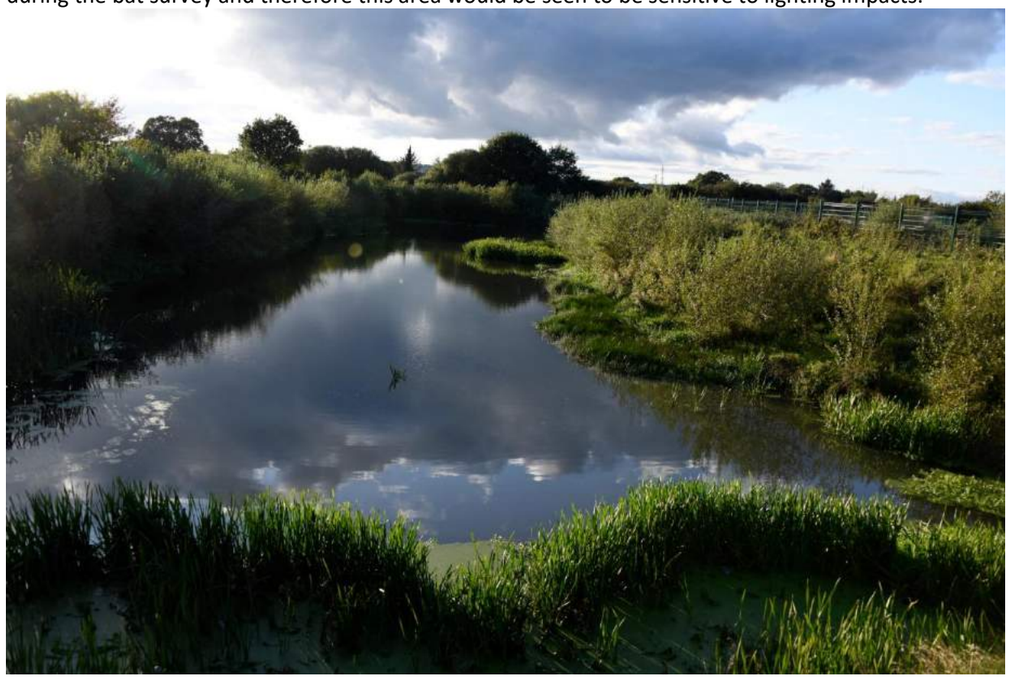

Plate 5-4 FL8-Other Artificial ponds and Lakes (attenuation pond on site)

FW1- Eroding Upland rivers

The Clonattin Stream, which forms the Clonattin River at the the location of the attennuation pond, is located along the entire the south eastern boundary of the proposed development site. The site is on a gradual slope and works could potentially impact the Clonattin Stream from silt laden surface water runoff. The Clonattin River is a tributary of the Banogue River and as outlined by Inland Fisheries Ireland[1] "*the Banoge and its tributaries are an important salmonid catchment and represent some of the best fisheries habitat of the entire Owenavorragh system. The Owenavorragh River catchment supports several listed Annex II of the (*Habitats*) Directive including Salmon, River Lamprey, Brook Lamprey, Sea Lamprey and Otter*." In addition IFI stated that because of the recent upgrade of the Gorey WWTP "*we expect to see a significant increase in salmon and trout populations in the Banoge River*". As a result the Clonattin Stream would be considered to be sensitive to impact and measures should be implemented to ensure water quality is maintained. In addition several drainage ditches are noted on site that lead to watercourses.

WL2- Treelines

Treelines are located eastern boundary and because of the lack of maintenance on site many of the hedgerows have developed into treelines in several areas of the site. The eastern treeline included Oak (*Quercus* spp.) and beech (Fagus spp) while numerous additional Oak are scattered across the site primarily within treelines and beside the Clonattin Stream. Other species included elder (*Sambucus nigra)*, blackthorn (*Prunus spinosa)*, hawthorn *(Crataegus monogyna),* holly *(Ilex aquifolium),* dog-rose *(Rosa canina),* bramble *(Rubus fruticosus agg.),* ash *(Fraxinus excelsior),* sycamore *(Acer pseudoplatanus),* ivy *(Hedera helix),* hedge bindweed (*Calystegia*

[1] http://www.pleanala.ie/publicaccess/EIAR-NIS/303813/2.%20JSA/EIAR/EIAR%20Appendices%20%20Vol%203.pdf

sepium), honeysuckle *(Lonicera periclymenum),* cleavers *(Galium aparine),) Gorse (Ulex europaeus),* devils poker (*Arum maculatum*) and bramble (*Rubus fruticosus agg*.).

Bats
As outlined in Appendix I "*There is no evidence of a current or past bat roost in the structures or trees on site, therefore no significant negative impacts on the roosting of these animals are expected to result from the proposed development. However, foraging activity within the area will be reduced unless, sufficient hedgerow planting is carried out to offset the loss in hedgerows and lighting of the site, in particular the pond, perimeter treeline and riparian corridor, comply with bat lighting guidelines*."

Evaluation of Habitats
The proposed development site is primarily on Improved agricultural grassland and scrub and with many areas having been significantly disturbed in the past. The Clonattin Stream, the existing attenuation pond and the treelines on site, with numerous mature oak, would form the most important features on site. No other habitats of conservation significance were noted within the site outline. However, the watercourses are proximate to the site and could be susceptible to pollution in the absence of mitigation measures.

Plant Species
The plant species encountered at the various locations on site are detailed above. No rare or plant species of conservation value were noted during the field assessment. Records of rare and threatened species from NBDC and NPWS were examined. No rare or threatened plant species were recorded in the vicinity of the proposed site.

Invasive Plant species
No invasive plant species that could hinder removal of soil from the site during groundworks, such as Japanese knotweed, giant rhubarb, Himalayan balsam or giant hogweed were noted on site.

Fauna
Soprano Pipistrelle (*Pipistrellus pygmaeus*) and Daubentons bats (*Myotis daubentonii*) were observed foraging along hedgerows and over the pond respectively See Appendix I).

Amphibians/Reptiles
The common frog (*Rana temporaria*) was not observed on site. However, there are features within the site boundary that could be important to frogs including the pond, drainage ditch and watercourses. It is likely that frogs may be present on site and they have been noted on site based on NPWS rare and protected data. The common lizard (*Zootoca vivipara*) or smooth newt (*Lissotriton vulgaris*) were not recorded on site.

Terrestrial Mammals
Badgers have been noted within the 10km^2 grid by the NPWS. No badgers or badger activity was noted on site. Hedgehogs (*Erinaceus erinaceus)* have been recorded by NPWS within the 10km square. No hedgehogs were seen during the site visit, but may be present on site. Other terrestrial mammals recorded by NPWS within the 10 km square include the otter (*Lutra lutra*). However, otter could be expected in the vicinity of the Clonattin River. No evidence of deer was noted on site.

Based on NPWS Rare and protected species data the following mammals have been noted within 10km squares proximate to the site but not within the site outline; west European Hedgehog (*Erinaceus europaeus*) (Gorey, Co. Wexford), Eurasian badger (*Meles meles*) (Duffeannig, Glenalough, Co. Wexford), Eurasian pygmy shrew (*Sorex minutus*) (Duffeannig, Glenalough, Co. Wexford), European otter (*Lutra lutra*) (Duffeannig, Glenalough, Co. Wexford), Irish hare (*Lepus timidus subsp. Hibernicus*)(Duffeannig, Glenalough, Co. Wexford) and Irish stoat (*Mustela erminea subsp. Hibernica*) (Duffeannig, Glenalough, Co. Wexford).

[2] https://birdwatchireland.ie/birds/meadow-pipit/

No rare or threatened faunal species were recorded in the vicinity of the proposed site based on NBDC records. As previously outlined the Common Frog (*Rana temporaria*) was noted on site by NPWS.

Birds
No rare or bird species of conservation value were noted during the field assessment. Meadow pipit (*Anthus pratensis*) is Amber listed. However, as outlined by Birdwatch Ireland[2] it is "*One of the commonest bird species in Ireland, favouring rough pastures and uplands*." The following bird species were noted on site:

Common Name	***Scientific Name***
Woodpigeon	*Columba palumbus*
Wren	*Troglodytes troglodytes*
Robin	*Erithacus rubecula*
Blackbird	*Turdus merula*
Blue tit	*Parus caeruleus*
Starling	*Sturnus vulgaris*
Great tit	*Parus major*
Rook	*Corvus frugilegus*
Magpie	*Pica pica*
Pheasant	*Phasianus colchicus*
Goldfinch	*Carduelis carduelis*
Meadow pipit	*Anthus pratensis (Amber)*
Mallard	*Anas platyrhynchos*

Table 5-2 Bird Species noted in the vicinity of the proposed development.

5.5 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed strategic housing development at this site in Clonattin, Gorey will include the demolition of the existing buildings and will provide 363 no. residential units, a creche, public open space, a new access road connecting to Courtown Road. All associated site development works and services provisions including parking, bin storage, substations, landscaping and all services required to facilitate the proposed development (Figures 5-8 to 5-10). A full description is provided in the statutory notices and in Chapter 3 of the EIAR.

Stormwater Drainage Arrangements
As outlined in the CS Consulting Engineering Services Report "*The proposed development site is currently undeveloped, however there is an existing development directly to the north (Clonattin Village). As part of the development of the Clonattin Village estate, a surface water pipe and an attenuation pond were constructed on the development lands subject to this application (Planning reference: 2003/4476). The attenuation pond was constructed to store approximately 6050 cubic metres of storm water (7,500m3 when you include the freeboard) which allowed for the future discharge of surface water runoff of the applicant lands to discharge into (Figure 5-11). The existing attenuation pond caters in excess of the 1 in 100 year storm event across both developments. A hydrobrake/flow control system was also installed on the outfall of the attenuation pond to the local stream and by restricting the flow, the likelihood of the proposed development adversely affecting the public drainage system or contributing to downstream flooding is mitigated. The existing hydrobrake/flow control system shall remain unchanged post the development of the applicant lands, therefore there shall be no increase in flood risk downstream of the applicant lands*."

Foul Drainage Infrastructure

As outlined in the CS Consulting Engineering Services Report "*Wexford County Council's drainage records indicate a 300mm diameter uPVC foul sewer running through the subject site, from Clonattin Village towards Courtown Road to south-west of the proposed development. As part of the new development the existing 300mm sewer will be diverted as necessary to correspond with the proposed road network of the new development and retain its connection point to network on the Courtown Road. All foul effluent generated from the proposed development shall be collected in pipes of 150mm and 225mm diameter and flow under gravity into the diverted 300mm diameter uPVC sewer via new connections*."

It should be noted that all foul drainage generated in Gorey, outfalls to a local pump station, where it is then pumped to the Courtown Waste Water Treatment plant. In 2016, Irish Water invested €7.2 million in upgrading the Courtown Wastewater Treatment Plant, ensuring that treated effluent standards are met and maintained to ensure a high quality of water in Courtown's coastal areas. The increased capacity allows all wastewater from both the Courtown and Gorey catchment areas to be treated[3].

A Site Specific Flood Risk Assessment was carried out by CS Consulting. It concluded:

- *"The site historically has no recorded flood events as noted in the OPW's historical flood maps.*
- *Predicted flood mapping for pluvial, tidal & fluvial flood events shall not affect the subject lands.*
- *The permitted development shall have a storm water attenuation system to address a 1 in 100 year (plus climate change) extreme storm. This shall significantly reduce the volume of storm water leaving the site during extreme storms which in turn shall not affect the downstream existing public drainage system.*
- *The likelihood of onsite flooding from the hydrogeological ground conditions are deemed to be minor and within acceptable levels*."

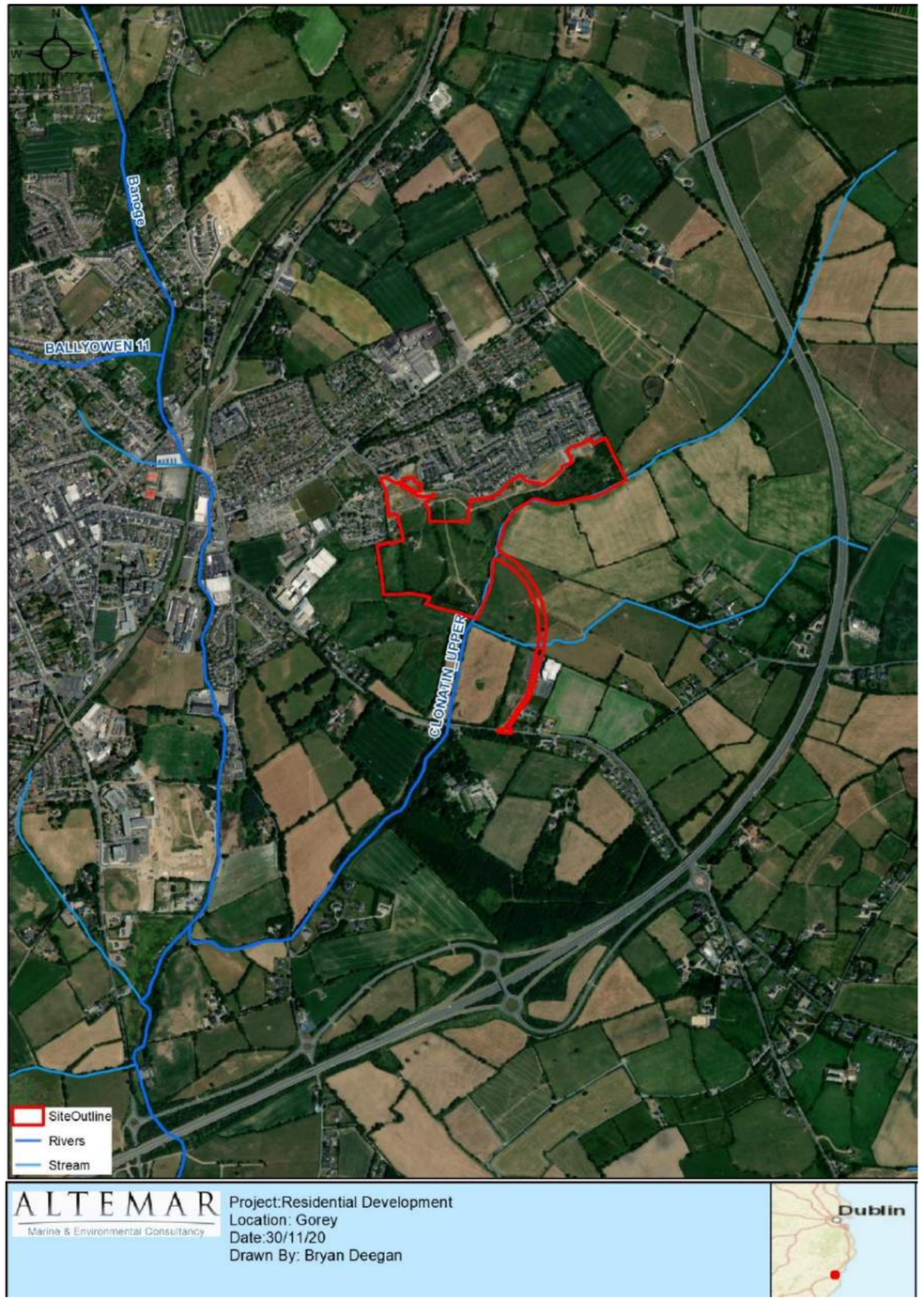

Figure 5-6 Approximate site outline and location south east of Gorey, Co. Wexford.

[3] https://www.independent.ie/regionals/goreyguardian/news/six-new-waste-water-plants-in-county-by-2021-37495262.html

Figure 5-7 Satellite Image of proposed site and proximity of the Clonattin Upper River.

Figure 5-8 Proposed Site

Figure 5-9 Proposed development

Figure 5-10 Proposed landscape plan and 10m riparian buffer from the Clonattin River.

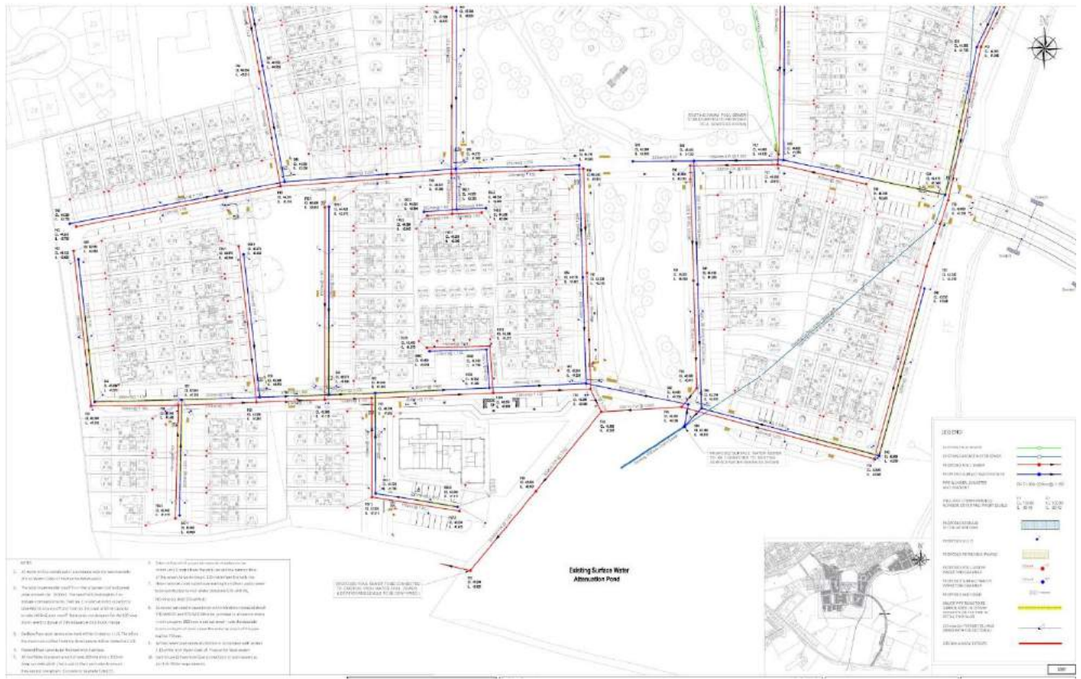

Figure 5-11 Proposed drainage strategy

5.6 IDENTIFICATION OF NATURA 2000 SITES/SPECIES POTENTIALLY AFFECTED.

The proposed works are not within a NATURA 2000 site. An AA Screening was carried out and is being submitted with this EIAR. The AA Screening concludes that "*No Natura 2000 sites are within the zone of influence of this development. Having taking into consideration the effluent discharge from the proposed development works, the distance between the proposed development site to designated conservation sites, lack of direct or indirect hydrological pathway or biodiversity corridor link to conservation sites and the dilution effect with other effluent and surface runoff, it is concluded that this development that would not give rise to any significant effects to designated sites. The construction and operation of the proposed development will not impact on the conservation objectives of features of interest of Natura 2000 sites.*". No terrestrial species or habitats of conservation importance were noted on site. Soprano pipistrelle bats were noted roosting on site.

5.7 POTENTIAL IMPACTS

Introduction

The proposed development will involve the removal of the existing terrestrial habitats on site and considerable re-profiling and excavations. The project also proposes to re-profile an area proximate to and cross the Clonattin Stream which would be considered ecologically sensitive.

Direct Impacts

Construction

The overall development of the site is likely to have direct negative impacts upon the existing habitats, fauna and flora. Direct negative effects will be manifested in terms of the removal of the site's internal habitats. The removal of these habitats will result in a loss of species of low biodiversity importance. However, several large Oak will be removed.

The area is not deemed to be an important foraging area for terrestrial mammals or birds. The riparian corridor and pond area would be considered locally important and scrub/treeline habitats would provide nesting habitat for birds and foraging areas for bats. It is recommended that compensatory planting is put in place to offset the loss in nesting habitat for birds and foraging corridors for bats. Mitigation measures will be required on site particularly in relation to the crossing of the Clonattin Stream. The demolition of the house will require a derogation licence and ecological supervision. The potential residual impacts of the proposed construction of the development on habitats and species is seen in Table 5-3 and 5-4 respectively.

Operation

Once developed, the site would be seen as a stable ecological environment. The landscaping elements in proximity Clonattin Stream and pond will form an important buffer reducing potential impacts. In addition, compensatory planting of native species will be important to re-establish nesting and foraging habitats lost. The potential residual impacts of the proposed operational phase of the development on habitats and species is seen in Table 5-5 and 5-6 respectively.

Indirect Impacts

Appropriate measures should be taken to prevent movement run-off and dust into adjacent habitats and in particular the attenuation pond which leads to the Clonattin River and the Clonattin Stream itself. Light spill should be avoided during construction and operation of the site particularly along the riparian buffer and over the pond areas in addition to treelines. The construction of new drainage networks will have to comply with SUDS and County Council requirements and as a result would have negligible impact on habitats and species surrounding proposed development site. An AA screening was carried out. It concluded that no significant effects on Natura 2000 sites are likely.

5.8 POTENTIAL CUMULATIVE IMPACTS

No terrestrial habitats, terrestrial mammals or flora of significant conservation importance were found on site. However, the site borders the Clonattin Stream which is deemed to be ecologically sensitive. Based on a review of the planning application viewer (www.myplan.ie) there are no developments of significance proposed in proximity of the proposed development. No in-combination effects are foreseen. However, it should be noted that the recent upgrading of the Gorey WWTP will result in the improvement of the water quality within the Owenavorragh River catchment which supports several listed Annex II of the (Habitats) Directive including Salmon, River Lamprey, Brook Lamprey, Sea Lamprey and Otter. As a result, it would be important that surface water quality from the proposed development is at a high level.

An AA screening was also carried out for this development. It concluded that the proposed project, in combination with other projects, is not likely to significantly impact Natura 2000 sites or their conservation interests.

5.9 MITIGATION MEASURES & MONITORING

Standard construction and operational controls will be incorporated into the proposed development project to minimise the potential negative impacts on the ecology within the Zone of Influence (ZoI) including the Clonattin Stream.

Construction Measures

Designated Conservation sites within 15km

No Natura 2000 sites are within the Zone of Influence. As the main potential vector for impacts would be seen to be via the Clonattin Stream, no additional controls are required besides those outlined below, during the construction and operational phases of the development, to mitigate against potential negative impacts on Court Dunes and Glen pNHA. The mitigation has been designed to ensure that the project will comply with the Water Pollution Acts and standard IFI Conditions in relation to construction and drainage. All construction and operational phase controls will be followed.

Development Construction

Contamination of watercourses. As existing drainage ditches are present on site and substantial instream works are proposed, a project ecologist should be appointed prior to works or site clearance commencing on site. All works in the riparian corridor must be carried out in consultation with and to the satisfaction of IFI and the project ecologist, following the best practice guidelines for construction in the vicinity of watercourses.

All works on site and in the riparian corridor should have sufficient mitigation measures to prevent silt from runoff during works. This should include measures outlined by the project ecologist including silt fences, phasing of the project to initially carry out diversion works and immediate landscaping of the riparian corridor following works.

Riparian Corridor Construction Stage

As significant site clearance is involved in the project and the site is on sloping land adjacent to a watercourse measures need to be put in place to ensure that runoff from the site during construction is contained and that silt is intercepted. A silt interception system will be prepared in consultation with the project ecologist. The purpose of this is to ensure that silt is removed from runoff prior to entering the stream and drainage ditches throughout the construction process. The following measures will be carried out to ensure that the site runoff is suitably contained during construction:

a) Site works will commence with the submission of a construction methodology to IFI. It should be noted that the watercourse will be fisheries compliant and will contain features for biodiversity enhancement. Following agreement of the methodology with IFI the excavation of the riparian diversion will be carried out in the dry, isolated from the existing watercourse. Only when all dry works have been completed and inspected by the ecologist and IFI will the stream become live.
b) Once the culvert has been carried out the riparian buffer of 10m will be established, landscaped and marked out prior to site clearance works on the remainder of the site. It is important that this area is cleared and landscaped in late spring/early summer as a portion of this area is within the potential flood zone of the river and landscaping needs to be well established prior to any risk of flooding, in order to limit any silt entering the stream during a flood.
c) The placing of silt fences in the riparian corridor will be carried out to prevent runoff entering the newly established riparian corridor. It is important that the bases of these are buried deeply in the soil as this area has the potential to be flooded and they could cause downstream impacts if not installed correctly. The riparian buffer of 10m will be established, landscaped and marked out to avoid machinery access, prior to site clearance works on the remainder of the site.
d) A temporary trench will be dug at the edge of the riparian corridor so that any runoff during works will run parallel to the river and be caught by silt fences and measures in the trench. All planting and landscaping should be carried out immediately.
e) Following the completion of this element of the project this area of the site will be closed off to machinery access.

Drainage on site outside the riparian corridor.

a) Channels will be prepared on site, in the vicinity of future access roads. Within these channels silt fences/barriers will be placed and will consist of woven/terram style material of suitable density to remove the majority of silt from runoff. These will be maintained throughout the construction phase to ensure efficiency, prior to the installation of the permanent drainage network.
b) Silt fences will be placed along the edge of the riparian corridor (outside of future construction areas) to capture runoff from the site. These will also prevent machinery from entering the riparian corridor.
c) Mitigation measures including silt fences will be in place (in consultation with the project ecologist and IFI) to capture silt from runoff and prevent it from entering the stream during the culvert works.
d) Appropriate storage and settlement facilities will be provided on site. This could include the provision of silt and petrochemical interception for water pumped on site (if required).
e) Fuel, oils and Chemicals will be stored on an impervious base with a bund. Under LEED there will be a strategy put in place to prevent pollution of the watercourse. In most cases this will involve collecting the run-off and routing it to treatment by filtration, settlement or specialist techniques.

Additional mitigation if required will be placed on roadworks to capture silt that may not be caught by road sweeping, before runoff enters the Dawson's Demesne Stream.

Culvert Installation Methodology

In addition to having a direct hydrological pathway to a pNHA downstream and the necessity to comply with Water Pollution Acts, it has been deemed necessary to limit the potential impact of the works and implement mitigation measures and carry out the instream works as follows:

Pre-Installation:

Prior to carrying out the works the project will:

- Submit a final methodology statement at least 1 month before the proposed in stream works to IFI.
- Notify IFI one week in advance of each culvert works commencing.
- Electrofish the water within the full extent of the works location to 50m downstream (if required by IFI), at the start of the project. Remove any fish and transport downstream (It would be preferable if this was carried out by IFI on the day of connection works if possible).

Installation process (live downstream culvert):

- A temporary stream diversion will be prepared with a 900mm diameter pipe.

- A minimum of four independent terram baffles will be placed downstream of the proposed works.
- The stream will be diverted through the pipe which will allow access to the bed of the original stream.
- The culvert will be installed in the dry while the river remains on its diverted course. The excavation will leave two areas of soil at either end of the diversion to prevent the river from entering the works area.
- Pumps will be placed within the diversion area should any seepage, rainwater or groundwater enter the works area. These are to be connected to silt busters/or to the onsite swales as directed by the project ecologist (and not directly back to the stream without filtering). Any seepage/rainwater/groundwater will be pumped onto open ground north of the river and allowed to seep naturally into the groundwater. No runoff will be allowed back into the stream.
- The excavated material will be stockpiled on site away from the watercourse (min 20m).
- The new culvert sections will be lifted with the crane and placed on to the bed of Sand/stone as required.
- Minor adjustments if required will be made to ensure the first section is correct for line and level.
- The remaining sections will be installed using the same procedure.
- On completion of the installation backfilling will commence to the sides of the culvert.
- Backfill material will be placed and compacted in layers.
- New ducting sections will be placed downstream of the culvert.
- The ecologist will be in attendance for environmentally sensitive works.
- On completion of the backfilling the small remaining bunds trench will be removed.
- Silt interception methods will be implemented downstream prior to instream works.
- Instream biodiversity elements will be placed within the watercourse as instructed by the ecologist/IFI.
- A gradual switchover will be implemented and the stream will flow through the newly installed culvert under supervision of project ecologist.
- A gradual switch over to the diversion will be monitored by the project ecologist. This will involve the stream being gradually dammed both upstream and downstream of the crossing location using sandbags.
- Once the full flow is in the diversion and stable the Existing stream bed will then be gradually blocked off with sandbags and final elements of rock armour will be carried out behind sand bags.
- When complete downstream mitigation measures will be removed.

Designed-in Mitigation

- All in-stream works methodologies must have prior approval of Inland Fisheries Ireland.
- Best available technology (BAT) mitigation measures designed by project ecologist
- Staging of project to reduce risks to watercourses from contamination with all instream works being carried out in Phase 1 of the project, where the stream is diverted, landscaped and protected from all subsequent phases.
- Local watercourses must be protected from dust, silt and surface water throughout the works.
- Local silt traps established throughout site.
- In stream works to be carried out in full consultation with and to the advice of Inland Fisheries Ireland and the project ecologist.
- Staging of project to initially stabilise, isolate, fence off watercourse on site
- Mitigation measures on site include dust control, stockpiling away from watercourses and drains
- Pollution control and mitigation on site
- Stockpiling of loose materials will be kept away from watercourses and drains. A risk based approach will be taken.
- Stockpiles and runoff areas following clearance will have suitable barriers to prevent runoff of fines into the drainage system and watercourses.
- Fuel, oil and chemical storage will be sited within a bunded area. A risk based approach will be taken.
- Bunds will be kept clean and spills within the bund area will be cleaned immediately to prevent groundwater contamination.
- During the construction works silt traps will be put in place in the vicinity of all runoff channels the stream to prevent sediment entering the watercourse.
- Petrochemical interception and bunds in refuelling area
- Planting in the vicinity of the stream crossings should be put in place as soon as possible to allow biodiversity corridors to establish.
- On-site inspections to be carried out by project ecologist.
- Maintenance of any drainage structures (e.g. de-silting operations) must not result in the release of contaminated water to the surface water network.
- No entry of solids to the associated stream or drainage network during the connection of pipework to the public water system
- Landscaping of the Riparian corridor should be carried out to the satisfaction of IFI.
- During the works silt traps will be put in place
- No discharges will be to the watercourse during and post works
- Silt traps established throughout site including a double silt fence between the site and the watercourse.
- Sufficient onsite cleaning of vehicles prior to leaving the site and on nearby roads, will be carried out, particularly during groundworks.
- The Site Manager will be responsible for the pollution prevention programme and will ensure that at least daily checks are carried out to ensure compliance. A record of these checks will be maintained.
- The site compound will include a dedicated bund for the storage of dangerous substances including fuels, oils etc. Refuelling of vehicles/machinery will only be carried out within the bunded area.
- A project ecologist must be appointed and be consulted in relation to all onsite drainage during construction works. Consultation with the project ecologist will not involve the formulation of new mitigation measures for the purposes of protecting any European Site, and relate only to the implementation of those mitigation measures already stated in the submission or the formulation of mitigation for other purposes.
- Dewatering of excavations may be necessary. Appropriate monitoring of groundwater levels during site works will be undertaken. Standard construction phase filtering of surface water for suspended solids will be carried out. Unfiltered surface water discharges or runoff are not permitted from the site into the drainage ditches or stream. Trenched double silt fencing shall be put in place along boundary of the proposed development site with 10m buffer from the Clonattin Stream. This fencing must be in place as one of the first stages on site and prior to the full site clearance. The silt fencing will act as a temporary sediment control device to protect the watercourse from sediment and potential site water runoff but also act as a tree protection zone for the riparian buffer. The fencing will be inspected twice daily, based on site and weather conditions, for any signs of contamination or excessive silt deposits.

Air & Dust

Dust may enter the Clonattin Stream via air or surface water with potential downstream impacts. Mitigation measures will be carried out reduce dust emissions to a level that avoids the possibility of adverse effects on the Clonattin Stream. The main activities that may give rise to dust emissions during construction include the following:

- Excavation of material;
- Materials handling and storage;
- Movement of vehicles (particularly HGV's) and mobile plant.
- Contaminated surface runoff

Mitigation measures to be in place:

- Following the instream works, maintain the existing 10m buffer with the Clonattin Stream with a double layer of silt fences
- Consultation will be carried with an ecologist throughout the construction phase;
- Trucks leaving the site with excavated material will be covered so as to avoid dust emissions along the haulage routes.
- Speed limits on site (15kmh) to reduce dust generation and mobilisation.
- The stream is to be protected from dust on site. This may require additional measures in the vicinity of the building during demolition e.g. placing of terram/protective material over the stream.

Site Management

- Regular inspections of the site and boundary should be carried out to monitor dust, records and notes on these inspections should be logged.
- Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.
- Make the complaints log available to the local authority when asked.
- Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the log book.

Waste

- Avoid bonfires and burning of waste materials.

Measures Specific to Earthworks

- Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.
- Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.
- Only remove the cover in small areas during work and not all at once.
- During dry and windy periods, and when there is a likelihood of dust nuisance, a bowser will operate to ensure moisture content is high enough to increase the stability of the soil and thus suppress dust.
- Due to the proximity of the Clonattin Stream an ecologist will oversee works in particular the excavation of material from the perimeter of the site.
- The Contractor will be required to consult with an ecologist prior to the beginning of works to identify any additional measures that may be appropriate and/or required.

Storage/Use of Materials, Plant & Equipment

- Materials, plant and equipment shall be stored in the proposed site compound location;
- Plant and equipment will not be parked within 50m of the Dawson's Demesne Stream at the end of the working day;
- Hazardous liquid materials or materials with potential to generate run-off shall not be stored within 50m of the Clonattin Stream.
- All oils, fuels and other hazardous liquid materials shall be clearly labelled and stored in an upright position in an enclosed bunded area within the proposed development site compound. The capacity of the bunded area shall conform with EPA Guidelines – hold 110% of the contents or 110% of the largest container whichever is greater;
- Fuel may be stored in the designated bunded area or in fuel bowsers located in the proposed compound location. Fuel bowsers shall be double skinned and equipped with certificates of conformity or integrity tested, in good condition and have no signs of leaks or spillages;
- Smaller quantities of fuel may be carried/stored in clearly labelled metal Jeri cans. Green for diesel and red for petrol and mixes. The Jeri cans shall be in good condition and have secure lockable lids. The Jeri cans shall be stored in a drip tray when not in use. They will not be stored within 50m of the Clonattin Stream;
- Drip trays will be turned upside down if not in use to prevent the collection of rainwater;
- Waters collected in drip trays must be assessed prior to discharge. If classified as contaminated, they shall be disposed by a permitted waste contractor in accordance with current waste management legal and regulatory requirements;
- Plant and equipment to be used during works, will be in good working order, fit for purpose, regularly serviced/maintained and have no evidence of leaks or drips;
- No plant used shall cause a public nuisance due to fumes, noise, and leakage or by causing an obstruction;
- Re-fuelling of machinery, plant or equipment will be carried out in the site compound as per the appointed Construction Contractor re-fuelling controls;
- The appointed Construction Contractor EERP will be implemented in the event of a material spillage;
- All persons working will receive work specific induction in relation to material storage arrangements and actions to be taken in the event of an accidental spillage. Daily environmental toolbox talks / briefing sessions will be conducted for all persons working to outline the relevant environmental control measures and to identify any environment risk areas/works.
- Consultation with Inland Fisheries Ireland will be carried out pre and post works is essential and to be led by the project ecologist.

Birds(National Protection)

- Retain hedgerows and trees where possible.
- Wildlife corridors provide additional shelter to minimise predation.
- "Relevant guidelines and legislation (Section 40 of the Wildlife Acts, 1976 to 2012) Should this not be possible, a pre-works check by a qualified ecologist should be undertaken to ensure nesting birds are absent. This would include nesting gulls on buildings if present.
- Nest boxes places on site to compensate for resource loss.
- Removal of potential nesting habitats outside of bird breeding season (March to August inclusive). Should this not be possible, a pre-works check by a qualified ecologist should be undertaken to ensure nesting birds are absent

Bats (international Protection)

- Derogation Licence required for demolition of house on site.
- Pre Construction survey for bats
- Retain hedgerows and ivy cover on trees where possible.
- Wildlife corridors provide additional shelter to minimise predation.
- Ecologist notified if bats found during demolition
- Lighting at all stages should be done sensitively on site with no direct lighting of hedgerows and treelines.
- Replanting of the riparian corridor at phase 1 of the project.
- 5 bat boxes should be placed on site as advised by the project ecologist to offset the loss of the roosting site.
- Lighting of the site should be as lighting plan with no lighting of the riparian corridor, the attenuation pond or central park areas. Light spin should be as per designed lighting plan.

Mammals (Terrestrial)

- A pre Construction survey should be carried out

Amphibians

- A pre Construction survey should be carried out

Operational Measures

Operational mitigation measures are primarily directed towards maintenance of mitigation measures that have been put in place during the construction phase. This would be directed towards ensuring compliance with Water Pollution Acts through the maintenance of onsite drainage infrastructure and ensuring lighting is maintained as per lighting plan. No additional operational mitigation measures are required.

5.10 PREDICTED IMPACTS

Standard construction and operational mitigation measures are proposed. These would ensure that water entering the Clonattin Stream, is clean and uncontaminated. However, given the proximity of numerous sensitive receptors and the watercourse leading to a pNHA, it should be noted that the early implementation of ecological supervision on site and consultation with IFI at initial mobilisation and enabling works is seen as an important element to the project, particularly in relation to the implementation of surface water runoff mitigation. Bata are also present on site and the project will involve the loss of a roosting site for three bats.

With the successful implementation of standard mitigation measures to limit surface water impacts on the Clonattin Stream, biodiversity mitigation/supervision and the successful installation and initiation of the culverts, no significant impacts are foreseen from the construction or operation of the proposed project. Residual impacts of the proposed project will be localised to the immediate vicinity of the proposed works. Positive impacts would be seen through the implementation of an improved riparian corridor with greater potential for biodiversity than currently exists on site.

The construction and operational mitigation proposed for the development satisfactorily addresses the mitigation of potential impacts on biodiversity and designated conservation sites through the application the standard construction and operational phase controls as outlined above. In particular, mitigation measures to ensure compliance with Water Pollution Acts and prevent silt and pollution entering the stream will satisfactorily address the potential impacts on downstream biodiversity and Natura 2000 sites. No significant adverse impacts on the conservation objectives of Natura 2000 sites are likely following the implementation of the mitigation measures outlined above.

It is essential that these measures outlined are complied with, to ensure that the proposed development does not have "downstream" environmental impacts. These measures are to protect the groundwater/surface water, which are potentially the primary vectors of impacts from the site, and ensure that it is not impacted during construction and /or operational phases of the proposed development. Ongoing consultation with IFI is essential.

5.11 RESIDUAL IMPACTS CONCLUSION

The construction and operational mitigation proposed for the development satisfactorily addresses the mitigation of potential impacts on the sensitive receptors through the application the standard construction and operational phase controls. The overall impact on the ecology of the proposed development will result in a long term slight positive residual impact on the ecology of the area and locality overall. This is primarily as a result of the loss of terrestrial habitats on site, supported by the creation of an improved biodiversity focused riparian corridor, additional biodiversity features, standard construction and operational controls and a sensitive native landscaping strategy. The implementation of SUDS drainage on site and riparian features in consultation with IFI would be seen as beneficial to the Clonattin Stream.

Construction Phase Impacts

Construction Impacts on habitats and sensitive receptors post mitigation

Habitat	Habitats Directive	Site Rating[4]	Construction Impact	Impact Significance
Watercourses		C	Mitigation measures will be put in place to avoid impacting this habitat through the introduction of silt or petrochemical protection measures.	Positive Long term
Scrub		E	Construction will result in the complete removal of this habitat.	Negligible
Recolonising Bare Ground/Bare Ground		E	No species of importance were noted on, or in, this habitat. The removal of this habitat will not result in the loss of species of importance.	Negligible
Hedgerows and Treelines		E	No species of importance were noted on, or in, the buildings or artificial surfaces. No bat roosts were noted on site. The removal of this habitat will not result in the loss of species of importance. Replanting of removed hedgerows will be carried out so as not to encourage tunnelling of the stream, but retain the foraging corridor for bats.	Positive in the long term
Natura 2000 and other conservation sites.	Yes	C	Mitigation measures will be put in place to avoid impacting this habitat through the introduction of silt or petrochemical protection measures.	Negligible
Built Land	No	E	Bats were roosting on site and the existing habitat will be replaced with new buildings. Mitigation is proposed	Slight negative/ short term

Table 5-3 Construction Phase Impacts on habitats and sensitive receptors post mitigation

Construction Impacts on species

Species	Rating	Construction Impact	Impact Significance
Mammals-Terrestrial	A-D	No other terrestrial mammals of conservation importance were noted on site. No badger activity or setts were noted. No otter activity or holts were noted. Lighting will be controlled towards watercourse.	Negligible
Mammals- Bats	A	Removal of small bat roost. Mitigation and derogation licence required.	Slight negative/ long term
Birds	D	Clearance of the site will result in the loss of nesting habitat. Subsequent planting and inclusion of bird boxes, could result in a positive impact.	Negligible/slight negative/ long term
Amphibians-Frogs	B	Evidence of frog activity was not noted on site.	Negligible
Terrestrial Flora	-	No flora of conservation significance were found on the site.	Negligible

Table 5-4 Construction Impacts on Species

Operational Impacts

Operational Impacts on habitats and sensitive receptors post mitigation

Habitat	Site Rating	Operational Impact	Impact Significance
Watercourses	C	The watercourse and riparian buffer will become a focus of the development which would be seen as a positive. However, there may be increased disturbance of the area with potential for interaction with the watercourse.	Positive/Neutral
Recolonising Bare Ground/Bare Ground	E	Construction will result in the complete removal of this habitat. It is not expected that the new site will not contain this habitat.	Negligible
Hedgerows and Treelines		Public lighting will not be located in the vicinity of this area.	Neutral

Table 5-5 Operational Impacts on Habitats and Sensitive Receptors post mitigation

Operational Impacts on species.

Species	Site Rating	Operational Impact	Impact Significance

[4] Site ecological evaluation rating: https://www.tii.ie/technical-services/environment/planning/Guidelines-for-Assessment-of-Ecological-Impacts-of-National-Road-Schemes.pdf

Mammals-Terrestrial	A-D	No other terrestrial mammals of conservation importance were noted on site.	Negligible
Mammals-Bats	A	Lighting will be done sensitively. Compensatory measures will need to be in place.	Neutral
Amphibians-Frogs	B	Evidence of frog activity was not noted on site. Mitigation measures including the improvement of the riparian corridor should be put in place prior to development construction.	Minor Adverse/ localised/short-term
Terrestrial Flora	-	No flora of conservation significance was found on the site.	Negligible
Aquatic Fauna		The successful implementation of landscape features are important to the biodiversity value of the watercourse.	Negligible based on controls.

Table 5-6 Operational Impacts on Species

Based on the successful implementation of the construction phase controls and proposed works to be carried out in accordance with this EIAR, including maintaining the riparian buffer, it is likely that there will be no significant ecological impact arising from construction and the day to day operation of the proposed development. The incorporation of native species planting, areas specifically for native biodiversity within the landscaping proposals and measures to enhance biodiversity would of benefit to the long-term biodiversity and residents on the site. Designated conservation sites will not be impacted by the proposed development.

Standard construction phase control measures have been outlined to ensure that the proposed project does not impact on species or habitats of conservation importance, conservation areas or watercourses. It is essential that these measures are complied with, to ensure that the proposed development does not have downstream environmental impacts. These measures are to protect the stream, which is potentially the primary vector of impacts from the site, is not impacted during construction and /or operational phases of the proposed development.

5.12‘DO NOTHING’ SCENARIO

Currently the site comprises primarily of agricultural land. It would be expected that the land would remain neglected in areas where that is currently the case and the biodiversity value of the site would increase as scrub continues to encroach the grassland areas.

5.13 WORST CASE SCENARIO

Pollution of the watercourse as a result of fire on site would be seen as the worst case scenario. It would be expected that surface runoff would enter the attenuation pond on site where it could be isolated and treated.

5.14 MONITORING & REINSTATEMENT

An ecologist will be appointed on site to carry out pre-construction surveys and consultation with IFI and project staff. Derogation licence required for the removal of house on site due to the presence of bats.

5.15 DIFFICULTIES IN COMPILING INFORMATION

There were no difficulties in compiling this biodiversity chapter.

5.16 REFERENCES

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6 LAND, SOIL AND GEOLOGY

6.1 INTRODUCTION

This section of the EIAR has been prepared by Cronin and Sutton Consulting Engineers and describes the existing land, soils and geology within the subject site. An assessment is made of the likely impact arising during the construction and operational phases of the development on these elements. Emphasis is also placed of contaminated ground and the effects that the scheme construction and operation have on the presence and movement of contaminants.

6.2 METHODOLGY

The assessment was carried out in accordance with the following best practice methodology and the following documents:

- Guidelines for the Preparation of Soil, Geology and Hydrogeology Chapters of Environment Impact Statements (Institute of Geologists of Ireland (IGI) 2013);
- Revised Guidelines on the Information to be contained in Environmental Impact Statements (EPA 2015a);
- Advice Notes for Preparing Environmental Impact Statements (EPA 2015b);
- Draft Guidelines on the Information to be contained in Environmental Impact Assessments Reports (EPA 2017).

6.3 RECEIVING ENVIRONMENT

According to the Geological Survey of Ireland interactive maps, the subject site is underlain with Rhyolitic volcanics, grey & brown slates. The area is listed as overlaying a regionally important aquifer (fissured bedrock). The groundwater vulnerability assessment of the site shows that the vulnerability of groundwater in the area is high.

The subject site is bounded to the east and southeast by a local stream (Clonattin Upper Stream), which flows south and connects to the River Banoge. It is not proposed to alter the hydrology of the surrounding area as part of the proposed development.

Surface Water Drainage

There is an existing 600mm diameter public storm drain traversing the development site where it outfalls into an existing attenuation pond constructed as part of the Clonattin Village development directly to the north. The attenuation pond was constructed to store approximately ***6050 cubic metres*** of storm water (7,500m3 when you include the freeboard) which allowed for the future discharge of surface water runoff of the applicant lands to discharge into. The existing attenuation pond caters in excess of the 1 in 100 year storm event across both developments.

Foul Drainage

Wexford County Council's drainage records indicate a 300mm diameter uPVC foul sewer running through the subject site, from Clonattin Village towards Courtown Road to south-west of the proposed development.

Water Supply

Records obtained from Wexford County Council's records indicate a 150mm diameter uPVC public watermain on Clonattin Village to the north of the proposed development.

6.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed strategic housing development at this site in Clonattin, Gorey will include the demolition of the existing buildings and will provide 363 no. residential units, a creche, public open space, a new access road connecting to Courtown Road. All associated site development works and services provisions including parking, bin storage, substations, landscaping and all services required to facilitate the proposed development. A full description is provided in the statutory notices and in Chapter 3 of the EIAR.

To fully utilize the site for its maximum potential of the various dwellings on site, the site is required to be significantly reprofiled. The existing site will be required to be reprofiled to allow the existing undulating topography to be changed to a more workable gentle sloped development site. Cut and fill exercises have been carried out across the lands and where possible areas of cut shall be reused in areas of fill to reduce the amount of material to leave site. From the assessment carried out on the current design there will be approximately 190 cubic metres of fill required for the development site.

6.5 POTENTIAL IMPACTS

Construction Phase

Excavated and stripped soil can be disturbed and eroded by site vehicles during the construction. Rainfall and wind can also impact on non-vegetated/uncovered areas within the excavation or where soil is stockpiled.

Noise and vibration will be generated through the construction phase particularly during pilling and excavation work.

The removal of soil from the ground could, without the adoption of appropriate control measures, lead to some ground movement in the immediate surrounds of the excavation with an associated risk of settlement and damage to buildings in the immediate area. Details of mitigation methods are outlined in the next section.

The presence of unrecorded contaminants in the groundwater and the exposure of site workers to existing contaminated groundwater.

The potential impact of dewatering and temporarily reducing the ground water level on surrounding structures.

The potential for groundwater from the construction phase of the project to contribute to contamination of the local ground or surface water sources.

The works shall entail removal of some vegetation on site deemed to be located within the operational area for the development upon completion. The extents to which vegetation is to be removed has been agreed with the schemes ecologist & landscapers to ensure that the optimal balance has been struck. The works will require areas not being effected to be cordoned off and protected. Following this machinery will clear the site and stock-pile the first 300mm of topsoil for re-use for localised planting.

The main works can then commence. The design development of the scheme a 3-D computer generation of the existing site was developed from the topographical survey, then using civil-3D, (an industry design software package) the required areas of the site to cut, where soil is to be removed, and filled, where soil is to be placed, to ensure a balancing of the sites topography. The use of computer software allows for highly accurate calculations to be made regarding his process. At present the 'fill' requirement is for an import volume in the region of 190m3 approximately.

Once the site has been re-profiled as required, services can be constructed and the foundations for the units & the roads completed.

Operational Phase

During the operational phase of the new developments it is envisaged that there will be little to no potential impact on the geology of the area or on groundwater resources.

The sources of pollution that could potentially have an effect on the soils and geology of applicant site during the operational phase of the development will be oil and fuel leaks from parked cars, service vehicles, HGV delivery's etc. The only direct discharge to the groundwater and soil environment during the operational phase is likely to be associated with infiltration through landscaped areas. Given the Proposed Development, it is considered unlikely significant sources of contamination will exist in these areas. Therefore, direct drainage to soils and groundwater is considered to be a negligible impact to a low/medium significance/sensitivity environment and the significance of the impact is imperceptible.

6.6 POTENTIAL CUMULATIVE IMPACTS

Construction Impacts

Cumulative impacts to land and soil, including groundwater, during construction processes are associated with cut/fill, spillage and leakage of oils and fuels and disturbance of land.

Individual impacts from the Proposed Development are generally considered to be negligible to medium impacts to a low to medium sensitivity environment, and the significance of the impacts has been assessed as imperceptible to moderate. As outlined in Section 6.7 below, mitigation measures proposed to manage and control potential impacts during construction of the Proposed Development will reduce the magnitude and significance of impacts from these developments to a minimum.

Taking account of mitigation measures proposed during the construction of the Proposed Development the potential impact is considered to be a low impact to a low/medium sensitivity environment and the significance of the impacts has been assessed as slight.

The potential cumulative impact of the Proposed Development and other consented developments is considered to be slight, assuming all residential units and associated infrastructure are constructed and operated in accordance with industry standards and best practice.

Operational Impacts

Potential impacts from consented development elsewhere, combined with the potential impacts of the Proposed Development, are unlikely to result in adverse impact to land and soil, including groundwater.

Potential impacts to groundwater from the Proposed Development range are imperceptible and mitigation measures proposed to manage and control potential impacts during operation will further reduce the magnitude and significance of impacts. Therefore, the cumulative operational impact of the Proposed Development is considered to be slight.

6.7 MITIGATION MEASURES

Construction Phase

The proposed development, to fully utilize the site requires the site to be re-profiled. The developed design has taken cognisance of this and as far as is reasonably practical the cut/fill for the scheme has optimised. It is unavoidable that the site has to be reprofiled but by striving to balance the cut/fill the requirement to bring in excessive volumes of material from off site has been mitigated as far as practical. Prior to commencement existing trees will be cordoned off and a demarcation fence secured around them to ensure their safety. A similar process of cordoning off the local water course, in accordance with the recommendations of the Construction Management Plan will be adhered too to ensure that all salient measures have been taken to protect the stream during the construction phase of the development.

Pouring of concrete should be carried out in the dry and allowed to cure. Mixer washings and excess concrete should not be discharged to surface water. Implementation of comprehensive and strict site housekeeping measures to isolate concrete from local surface waters is essential.

Oil storage tanks should have secondary containment provided by means of an above ground bund to capture any oil leakage irrespective of whether it rises from leakage of the tank itself or from associated equipment such as filling and off-take points, sighting gauges etc., all of which should be located within the bund. Bund specification should conform to the current best practice for oil storage (Enterprise Ireland BPGC5005).

Refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles, will take place in a designated area (or where possible off the site) which will be away from nearby surface water gulleys or drains. In the event of a machine requiring refuelling outside of this area, fuel will be transported in a mobile double skinned tank. An adequate supply of spill kits and hydrocarbon adsorbent packs will be stored in this area. All relevant personnel will be fully trained in the use of this equipment. Guidelines such as "Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors" (CIRIA 532, 2001) will be complied with. Wheel wash facilities should also be provided in a designated area (or where possible off the site).

Operational Phase

The sources of pollution that could potentially have an effect on the land and soils during the operational phase of the development will be oil and fuel leaks from parked cars, service vehicles, HGV delivery's etc. Hydrocarbon interceptors such as the tree pit drainage etc will be provided in storm water drainage network and Petrol interceptors will be installed within the development to cater for these oil/fuel leaks as required and prevent contamination of the subsoils and groundwater etc.

Run-off from hardstanding areas will pass through a closed drainage system, which will incorporate silt traps and oil/petrol interceptors, to mitigate the possibility of potentially contaminated surface water from contaminating the soil and bedrock geology. This drainage system will then discharge into the existing onsite attenuation pond and with the outflow restricted to greenfield runoff rates to the adjacent stream (Clonattin Upper Stream). It is not predicted that there will be any adverse effects on the soils and geology during the operational phase of the development.

6.8 PREDICTED IMPACTS

Construction Phase

The proposed development will alter the current land use from agricultural to a residential development and associated landscape areas. The impact on land, soil, geology and hydrogeology from accidental spillages of fuel and lubricants used during the construction phase of the development is predicted to be minimal when stored and used in a responsible manner. After implementation of the mitigation measures recommended above for the

construction phase, the proposed development will not give rise to any significant long term adverse impact. Moderate negative impacts during the construction phase will be short term only in duration

Operational Phase

Residual Impacts such as loss of agricultural land and associated landscaped areas across the development lands.

6.9 'DO NOTHING' SCENARIO

The existing development lands would be retained for agricultural use.

6.10 WORST CASE SCENARIO

During the construction, accidental spillages of fuel and lubricants may occur during the works, but this risk is deemed to low minimal if these items are stored in a responsible manner.

6.11 MONITORING & REINSTATEMENT

Monitoring Measures – Construction

Proposed monitoring during the construction phase in relation to the soil and geological environment are as follows:

- Adherence to the "Construction Management Plan (CMP)". The developer will be responsible for ensuring adherence with the "Construction Management Plan". If construction works are not in accordance with the plan, then the developer will ensure that this is remedied.
- Construction monitoring of the works (e.g. inspection of existing ground conditions on completion of cut to road sub-formation level in advance of placing capping material, stability of excavations etc.).
- Inspection of fuel / oil storage areas. If these are found to be sub-standard then the developer will ensure that they are made fit for purpose.
- Monitoring cleanliness of adjacent road network, implementation of dust suppression and provision of vehicle wheel wash facilities. If these measures are found to be inadequate and the adjacent road network is negatively impacted, the developer will ensure that this is remedied and will ensure that dust suppression measures are implemented more regularly and all vehicles exiting the site use vehicle wheel wash facilities provided.
- Monitoring of contractor's stockpile management (e.g. protection of excavated materialto be reused as fill; protection of soils from contamination for removal from site).
- Monitoring sediment control measures (sediment retention ponds, surface water inlet protection etc.). The developer is responsible for ensuring that these measures are fit for purpose. If they are found to be inadequate, then the main contractor will ensure that they are made good and fully utilised.
- Soil removed during the construction phase will be monitored to maximise potential for re-use on site.
- The quantities of topsoil, subsoil etc will be recorded.

Monitoring Measures – Operational Phase

As the proposed completed development will offered for taking in charge to Wexford County Council monitoring of the development site will be the responsibility of the local authority to carry out any maintenance works required. Until such time as the development is taking in charge the developer will be responsibly of monitoring/maintenance the development site.

6.12 DIFFICULTIES IN COMPILING INFORMATION

A site investigation is yet to be undertaken for the development site. This section has been reviewed against high level information from Geological Survey of Ireland Maps.

6.13 REFERENCES

The following documents were reviewed in the preparation of this chapter:

- Guidelines for the Preparation of Soil, Geology and Hydrogeology Chapters of Environment Impact Statements (Institute of Geologists of Ireland (IGI) 2013);
- Revised Guidelines on the Information to be contained in Environmental Impact Statements (EPA 2015a);
- Advice Notes for Preparing Environmental Impact Statements (EPA 2015b);
- Draft Guidelines on the Information to be contained in Environmental Impact Assessments Reports (EPA 2017).

7 HYDROLOGY AND WATER SERVICES

7.1 INTRODUCTION

This chapter of the EIAR addresses the proposed development within the context of the potential effect which may affect the subject lands in respect to hydrology and water. In addition, this chapter looks at the potential for the proposed development to affect off site flooding events. This chapter should be read in accordance with the *Site Specific Flood Risk Assessment* prepared and submitted with this application by CS Consulting.

7.2 METHODOLOGY

In preparing this chapter, CS Consulting has made reference to the following:

- Wexford County Development Plan 2013-2019; (including Strategic Flood Risk Assessment)
- Gorey Town & Environs Local Area Plan 2017-2023; (including Strategic Flood Risk Assessment)
- Greater Dublin regional Code of Practice for Works;
- Office of Public Works Flood Maps;
- Department of the Environment Flooding Guidelines;
- Geological Survey of Ireland Maps;
- Local Authority Drainage Records.

7.3 RECEIVING ENVIRONMENT

The subject site is bounded to the east and southeast by a local stream (Clonattin Upper Stream), which flows south and connects to the River Banoge. It is not proposed to alter the hydrology of the surrounding area as part of the proposed development.

Surface Water Drainage

There is an existing 600mm diameter public storm drain traversing the development site where it outfalls into an existing attenuation pond constructed as part of the Clonattin Village development directly to the north. The attenuation pond was constructed to store approximately 6050 cubic metres of storm water (7,500m3 when you include the freeboard) which allowed for the future discharge of surface water runoff of the applicant lands to discharge into. The existing attenuation pond caters in excess of the 1 in 100 year storm event across both developments.

Foul Drainage

Wexford County Council's drainage records indicate a 300mm diameter uPVC foul sewer running through the subject site, from Clonattin Village towards Courtown Road to south-west of the proposed development.

Water Supply

Records obtained from Wexford County Council's records indicate a 150mm diameter uPVC public watermain on Clonattin Village to the north of the proposed development.

7.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed strategic housing development at this site in Clonattin, Gorey will include the demolition of the existing buildings and will provide 363 no. residential units, a creche, public open space, a new access road connecting to Courtown Road. All associated site development works and services provisions including parking, bin storage, substations, landscaping and all services required to facilitate the proposed development. A full description is provided in the statutory notices and in Chapter 3 of the EIAR.

Surface Water Drainage

As part of the new development the existing 600mm surface water pipe shall be diverted as necessary to correspond with the proposed road network of the new development and retain its outfall connection to the existing attenuation pond.

The proposed development will discharge into the existing attenuation pond constructed as part of the Clonattin Village development.

Foul Drainage

As part of the new development the existing 300mm sewer will be diverted as necessary to correspond with the proposed road network of the new development and retain its connection point to network on the Courtown Road.

All foul effluent generated from the proposed development shall be collected in pipes of 150mm and 225mm diameter and flow under gravity into the diverted 300mm diameter uPVC sewer via new connections. The drainage network for the development shall be in accordance with Part H of the Building Regulations and to the requirements and specifications of Irish Water.

Water Supply

It is proposed to make new connections off the existing 150mm diameter public watermains on Clonattin Village to the development site and supply a 100mm and 150mm internal diameter watermain to the proposed development site.

7.5 POTENTIAL IMPACTS

Construction Phase

In relation to the construction phase, the stripping of the existing ground surface and construction activities could potentially lead to increased sedimentation within nearby surface waters. Operation of machinery and use of chemicals and concrete during the construction phase has the potential to pollute the nearby public surface water network and receiving watercourse. However, the implementation of mitigation measures highlighted in this report will significantly reduce the likelihood and magnitude of the potential impacts on the surface water environment occurring during the construction phase. The potential impact is therefore considered to be low with a short duration and therefore considered to be not significant.

The subject site is bounded to the east and southeast by a local stream (Clonattin Upper Stream), which flows south and connects to the River Banoge. The South Eastern Catchment Flood Risk Assessment and Management Study (CFRAM) conducted by the OPW has produced maps of fluvial (river) flooding risk for the area surrounding the subject site. CFRAM maps indicate that the stream mentioned above, has a fluvial flood extent which affects

the lands to east of the subject site. Therefore, there is little to no impact during construction phase on the development lands.

Surface water runoff during the construction phase may contain increased silt levels (e.g. runoff across areas stripped of topsoil) or become polluted by construction activities. This has the potential to result in increased silt and pollutant levels into existing nearby watercourses. In the absence of mitigation, it is likely that this activity would have a slight, adverse, temporary, residual impact on the watercourses.

Heavy rainfall or a high level of ground water could produce ponding in open trenches. Discharge of this rainfall pumped from excavations to existing streams could compromise the capacity or the stream and as such cause flooding. This impact may be characterised as a likely, moderate, temporary, adverse impact. The consequence of this will increase the flow within the existing stream and hence potentially cause flooding.

Discharge of wash water from concrete trucks and discharge of vehicle wheel wash water will contaminate the groundwater. This impact may be characterised as a temporary, regionally short term moderate impact. It is likely that this activity would have a temporary, adverse, slight, adverse, impact on groundwater and local watercourses within the area.

Operational Phase

The proposed development site is currently undeveloped and of agricultural use, however there is an existing development directly to the north (Clonattin Village). As part of the development of the Clonattin Village estate, a surface water pipe and an attenuation pond were constructed on the development lands subject to this application (Planning reference: 2003/4476). The attenuation pond was constructed to store approximately 6050 cubic metres of storm water (7,500m3 when you include the freeboard) which allowed for the future discharge of surface water runoff of the subject lands to discharge into. The existing pond caters in excess of the 1 in 100 year storm event across both developments.

A hydrobrake/flow control system was also installed on the outfall of the attenuation pond to the local stream. The flow rate at this outfall will remain unchanged from current flows; by restricting the flow, the likelihood of the proposed development adversely affecting the public drainage system or contributing to downstream flooding is mitigated.

7.6 POTENTIAL CUMULATIVE IMPACTS

Construction Impacts

Cumulative impacts to land and soil, including groundwater, during construction processes are associated with cut/fill, spillage and leakage of oils and fuels and disturbance of land.

Individual impacts from the Proposed Development are generally considered to be negligible to medium impacts to a low to medium sensitivity environment, and the significance of the impacts has been assessed as imperceptible to moderate.

As outlined in Section 7.7 below, mitigation measures proposed to manage and control potential impacts during construction of the Proposed Development will reduce the magnitude and significance of impacts from these developments to a minimum.

Taking account of mitigation measures proposed during the construction of the Proposed Development the potential impact is considered to be a low impact to a low/medium sensitivity environment and the significance of the impacts has been assessed as slight.

The potential cumulative impact of the Proposed Development and other consented developments is considered to be slight, assuming all residential units and associated infrastructure are constructed and operated in accordance with industry standards and best practice.

Operational Impacts

Potential impacts from consented development elsewhere, combined with the potential impacts of the Proposed Development, are unlikely to result in adverse impact to land and soil, including groundwater.

Potential impacts to groundwater from the Proposed Development range are imperceptible and mitigation measures proposed to manage and control potential impacts during operation will further reduce the magnitude and significance of impacts. Therefore, the cumulative operational impact of the Proposed Development is considered to be slight.

7.7 MITIGATION MEASURES

Construction Phase

The contractor will be responsible in ensuring the existing storm network to the north, traversing the development lands and the existing attenuation pond are free from waste materials generated during the construction of the proposed development, including the initial site clearance and excavation. Routine visual inspections by the contractor will reduce any risk of excess construction materials causing blockages in the surface water network and any potential flooding occurring. A maintenance schedule and operational schedule should be established by the contractor for silt and pollution control measures during the construction period. This should be undertaken in consultation with the relevant statutory authorities.

Run-off from the working site or any areas of exposed soil should be channelled and intercepted at regular intervals for discharge to silt traps or lagoons with over-flows directed to land rather than to a watercourse.

Pouring of concrete should be carried out in the dry and allowed to cure. Mixer washings and excess concrete should not be discharged to surface water. Implementation of comprehensive and strict site housekeeping measures to isolate concrete from local surface waters is essential.

Oil storage tank(s) and the associated filling area and distribution pipe work should be at least 10m distant from the surface watercourses. Storage tanks should have secondary containment provided by means of an above ground bund to capture any oil leakage irrespective of whether it rises from leakage of the tank itself or from associated equipment such as filling and off-take points, sighting gauges etc., all of which should be located within the bund. Bund specification should conform to the current best practice for oil storage (Enterprise Ireland BPGC5005).

A Construction and Environmental Management Plan will be developed and implemented during the construction phase. Site inductions will include reference to the procedures and best practice as outlined in the Construction and Environment Management Plan.

Surface water runoff from areas stripped of topsoil and surface water collected in excavations will be directed to on-site settlement ponds where measures will be implemented to capture and treat sediment laden runoff prior to discharge of surface water at a controlled rate.

Weather conditions and seasonal weather variations will also be taken account of when planning stripping of topsoil and excavations, with an objective of minimizing soil erosion.

Hazardous construction materials shall be stored appropriately to prevent contamination of watercourses or groundwater.

Spill kits should be kept in designated areas for re-fuelling of construction machinery.

Dewatering measures should only be employed where necessary.

Operational Phase

The proposed re-development of the site will not have any physical impact on the areas adjacent to the development site. These areas, while they will be enhanced with improved soft landscaping will not infringe or remove any capacity from the naturally occurring flood plain. Also, to mitigate against the increased storm water runoff which will be generated following the development of the scheme will discharge to the existing attenuation pond which has been sized to incorporate the development lands. The flow rate at this outfall of the pond to the Clonattin Upper Stream will remain unchanged from current flows; by restricting the flow, the likelihood of the proposed development adversely affecting or contributing to downstream flooding is mitigated.

7.8 PREDICTED IMPACTS

Construction Phase

In relation to the construction phase, the stripping of the existing ground surface and construction activities could potentially lead to increased sedimentation within nearby surface waters.

Operation of machinery and use of chemicals and concrete during the construction phase has the potential to pollute the nearby public surface water network and receiving watercourse.

However, the implementation of mitigation measures highlighted in this report will significantly reduce the likelihood and magnitude of the potential impacts on the surface water environment occurring during the construction phase. The potential impact is therefore considered to be low with a short duration and therefore considered to be not significant.

Operational Phase

The sources of pollution that could potentially have an effect on surface or groundwater during the operational phase of the development will be oil and fuel leaks from parked cars, service vehicles, HGV delivery's etc. Hydrocarbon interceptors such as the tree pit drainage etc will be provided in storm water drainage network and Petrol interceptors will be installed within the development to cater for these oil/fuel leaks as required.

It is not anticipated that flooding of the site will occur, due to the fact that there is no historical data which refers to any past flooding on this site and that the site is located in Flood Zone C, please refer to the Flood Risk Assessment under separate cover included with this planning application.

As the applicant site is to be attenuated to greenfield runoff rates and that this flow rate from the existing attenuation pond to the Clonattin Upper Stream will remain unchanged from current flows, the proposed development will not adversely affecting the public drainage system or contributing to downstream flooding.

7.9 'DO NOTHING' SCENARIO

The existing development lands would be retained for agricultural use.

7.10 WORST CASE SCENARIO

In the unlikely event a blockage or damage to pipe occurs, excess flood water may over spill onto the local road network of the development lands. A flood exceedance route has been designed into the road network to ensure any excess flood water flows and ponds away from the residential units to green landscaped areas.

During construction if the contractor fails to install appropriate mitigation measures during construction (mentioned above) there is a risk of pollution of oil, concrete etc entering the existing pond and onwards to the Clonattin Upper Stream and the downstream surface water network.

7.11 MONITORING & REINSTATEMENT

Invariably following the development of the subject lands reinstatement will be required the lands adjacent to the stream. This proposed reinstatement will be in accordance with the proposed landscape plans submitted with this application to improve and enhance this area of the site.

As the site is developed the monitoring shall be carried out by the main contractor and under their direction subcontractors. Post development, the responsibility for monitoring will fall to the developer until such time as the development site is taken in charge by the local authority.

7.12 DIFFICULTIES IN COMPILING INFORMATION

A site investigation is yet to be undertaken for the development site. This section has been reviewed against high level information from Geological Survey of Ireland Maps.

7.13 REFERENCES

The following documents were reviewed in the preparation of this chapter:

- Wexford County Development Plan 2013-2019; (including Strategic Flood Risk Assessment)
- Gorey Town & Environs Local Area Plan 2017-2023; (including Strategic Flood Risk Assessment)
- Greater Dublin regional Code of Practice for Works;
- Office of Public Works Flood Maps;
- Department of the Environment Flooding Guidelines;
- Geological Survey of Ireland Maps;
- Local Authority Drainage Records.

8 NOISE & VIBRATION

8.1 INTRODUCTION

This section of the EIAR has been prepared by Traynor Environmental Ltd to identify and assess the potential noise impacts associated with the proposed development of lands for mixed use development in Clonattin, Gorey, Co. Wexford during both the construction and operational phases of the development.

This chapter includes:

- A description of the receiving ambient noise climate in the vicinity of the subject site.
- An assessment of the potential noise and vibration impact associated with the proposed development during
    - The short-term construction phase and
    - The long-term operational phase on its surrounding environment.
- The assessment of direct, indirect and cumulative noise and vibration impacts on the surrounding environment have been considered as part of the assessment.

Mitigation measures are included, where relevant, to ensure the proposed development is constructed and operated in an environmentally sustainable manner in order to ensure minimal impact on the receiving environment.

Proposed Development Site Location and Brief Description

This is as described in chapters 1 (introduction) and 3 (Description of Development) of this EIAR and as set out in the statutory notices.

Statement of Competence

In accordance with Article 5(3)(a) of the EU Directive, by appointing Traynor Environmental, the applicant has ensured that this chapter has been prepared by "Competent experts".

In accordance with Environmental Protection Agency (EPA) guidance "All competent persons must possess a combination of technical knowledge, experience and skills, and must be able to demonstrate both practical and theoretical competence and should participate in continual professional development. Competence may be demonstrated through reference to an appropriate qualification and/or professional membership of a recognised acoustic organisation (e.g. the Institute of Acoustics) and/or appropriate experience".

The monitoring and analysis of the data was conducted by Nevin Traynor of Traynor Environmental deemed to be a "competent person" as per criteria outlined by the EPA. The monitoring programme, data and report was carried out by Nevin Traynor who is certified as been competent in Environmental Noise Measurement by the Institute of Acoustics (IOA) with over 15 years' experience in Environmental and Acoustic Consultancy.

8.2 METHODOLOGY

This assessment meets the requirements for an EIAR, as outlined in the relevant National and EU legislation, and has been prepared in accordance with guidance documents.

- BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites - Part 1 – Noise.
- BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites - Part 2 -Vibration.
- BS 7385-2:1993 *Guide for measurement of vibrations and evaluation of their effects on buildings*.
- *BS 4142: 2014: Methods for Rating and Assessing Industrial and Commercial Sound.*
- BS 8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings.
- BS 6841 (1987): Measurement and evaluation of human exposure to whole-body mechanical vibration and repeated shock.
- *ISO 1996: 2017: Acoustics - Description, Measurement and Assessment of Environmental Noise.*
- ProPG: Planning & Noise.
- EPA Advice Notes for Preparing Environmental Impact Statements, (Draft, September 2015).

The study has been undertaken using the following methodology:

- Baseline Noise monitoring and an Environmental Noise Survey has been undertaken across the development area to determine the range of noise levels at varying locations across the site.
    - The equipment used was two Larson Davis Sound Expert LxT and a Larson Davis Expert 831.
    - The Baseline monitoring periods were from November 08th up to and including November 10th, 2019 at Locations A, B & C.
    - The Environmental Noise Survey monitoring period was carried out at four noise monitoring locations around the proposed development on November 11th, 2019 between 08:00hrs to 17:45hrs.
- A review of the most applicable standards and guidelines has been conducted in order to set a range of acceptable noise and vibration criteria for the construction and operational phases of the proposed development, this is summarised in the following sections.
- Predictive calculations have been performed to estimate the likely noise emissions during the construction phase of the project at the nearest sensitive locations (NSLs) to the site.
- Predictive calculations have been performed to assess the potential impacts associated with the operation of the development at the most sensitive locations surrounding the development site; and,
- A schedule of mitigation measures has been proposed, where relevant, to control the noise and vibration emissions associated with both the construction and operational phases of the proposed development.

Construction Phase – Noise Assessment Criteria

There is no published statutory Irish guidance relating to the maximum permissible noise level that may be generated during the construction phase of a project. Wexford County Council (WCC) typically controls construction activities by imposing limits on the hours of operation and consider noise limits at their discretion.

In order to set appropriate construction noise limits for the development site, reference has been made to *BS 5228 - 1:2009 +A1 2014 Code of practice for noise and vibration control on construction and open sites- Noise*. Part 1 of this document Noise provides guidance on selecting appropriate noise criteria relating to construction works.

BS 5228-1:2009+A 1:2014 gives several examples of acceptable limits of construction noise, the most simplistic being based on upon the exceedance of fixed noise limits. For example, paragraph E.2 states:

'noise from construction and demolition sites should not exceed the level at which conversation in the nearest building would be difficult with windows shut.'

Paragraph E.2 goes on to state:
'noise levels, between 07:00 and 19:00 hours; outside the nearest window of the occupied room closest to the site boundary should not exceed:
70 decibels (dBA) in rural, suburban areas away from the main road traffic and industrial noise.
75 decibels (dBA) in urban areas near main roads in heavy industrial areas.'

Note that a typical planning condition in relation to construction noise issued by Local Authorities refer also to the compliance with BS 5228 part 1 as a means of controlling impacts to the surrounding environment. BS 5228 has therefore been used to inform the assessment approach for construction noise in line with Local Authorities requirements.

For residential properties it is considered appropriate to adopt the 75dB(A) during daytime. The construction noise limits, which are presented in Table 8.1 represent a reasonable compromise between the practical limitations in a construction project, and the need to ensure an acceptable noise level for the nearby residents and their sensitive receptors including amenity space. Table 8.1 specifies the recommended Project Noise Limit Criteria in accordance NRA Maximum Permissible Construction Phase Noise Levels at the Façade of Dwellings during road developments.

Construction Phase Noise Limit Criteria		
Days & Times	**L_{Aeq}, (1hr) dB**	**$L_{pA(max)}$ slow dB**
Monday to Friday - 07:00 to 19:00	70	80
Monday to Friday - 19:00 to 22:00	60	65
Saturday - 08:00 to 16:30	65	75
Sundays and Bank Holidays - 08:00 to 16:30	60	65

Table 8-1 NRA Maximum Permissible Construction Phase Noise Levels at the Façade of Dwellings during Road Developments.

Note 1: Construction activity at these times, other than that required in respect of emergency works, will normally require the explicit permission of the relevant local authority. For the appropriate assessment period (i.e. daytime in this instance) the ambient noise level is determined. If the construction noise exceeds, then a significant effect is deemed to occur.

The closest neighbouring noise sensitive property to the proposed development is a residential dwelling located approximately 8m north of the proposed site.

Construction Phase – Vibration Assessment Criteria

Guidance relevant to acceptable vibration in order to avoid damage to buildings is contained within *BS 7385-2 (1993*). The guidance values contained within *BS 7385* are reproduced also in *British Standard BS 5228-2 (2009).*

These standards differentiate between transient and continuous vibration. Surface construction activities are considered to be transient in nature as they occur for a limited period of time at a given location. The standards note that the risk of cosmetic damage to residential buildings starts at a Peak Particle Velocity (PPV) of 15mm/s at 4Hz. The standard also notes that below 12.5mm/s PPV the risk of damage tends to zero. Both standards note that important buildings that are difficult to repair might require special consideration on a case by case basis but building of historical importance should not (unless it is structurally unsound) be assumed to be more sensitive. If a building is in a very unstable state, then it will tend to be more vulnerable to the possibility of damage arising from vibration or any other ground borne disturbance.

Table 8.2 summarises the proposed vibration criteria below which there is no risk of damage to buildings. These limits apply to vibration frequencies less than 15Hz where the most conservative limits are required. If there are any protected buildings near the works, there is a greater potential for these to be more vulnerable than other adjacent modern structures. Therefore, on a precautionary basis, the guidance values for structurally sound buildings are reduced by 50% in line with the guidance documents referred to above.

Category of Building	**Threshold of potential significant effect (Peak Particle Velocity - PPV - at building foundation) for Transient Vibration**
Structurally sound and non-protected buildings	12 mm/s
Protected and / or potentially vulnerable buildings	6 mm/s

Table 8-2: Transient Vibration Impact Criteria for Buildings (Conservative Criteria below which there is No Risk of Cosmetic Damage). Source: "Guidelines for the Treatment of Noise & Vibration in National Road Schemes", NRA, 2004

Building Response
As previously mentioned in table 8.2 the standard notes that below 12 mm/s PPV the risk of damage tends to zero. It is therefore common, on a cautious basis to use this lower value. Taking this into consideration the vibration criteria in Table 8.3 is recommended.

Allowable vibration (in terms of peak particle velocity) at the closest part of sensitive property to the source of vibration, at a frequency of		
Less than 15Hz	15 to 40Hz	40Hz and above
12 mm/s	20 mm/s	50 mm/s

Table 8-3 Recommended Vibration Criteria During Construction Phase

Expected vibration levels from the construction works will be discussed further in Section 8.5.

Human Perception

It is acknowledged that humans are sensitive to vibration stimuli and that perception of vibration at high magnitudes may lead to concern. Vibration typically becomes perceptible at around 0.15 to 0.3 mm/s and may become disturbing or annoying at higher magnitudes. However, higher levels of vibration are typically tolerated for single events or events of short-term duration, particularly during construction projects and when the origin of vibration is known. For example, piling can typically be tolerated at vibration levels up to 6 mm/s respectively if adequate public relations are in place. These values refer to the day and evening time periods only.

Operational Phase -Noise Assessment Criteria

The operational phase of the development has been assessed with regard to the Local Authorities in the Wexford in their role as designated Action Planning Authorities under Article 7 of the Environmental Noise Regulations 2006, Statutory Instrument Number 140 of 2006 (the Regulations). The Action Plan is aimed at managing Environmental Noise and excludes noise from domestic activities, noise created by neighbours, noise at workplaces or construction noise as these can be dealt with under existing legislation such as the Environmental Protection Agency Act 1992 and Health & Safety legislation.

Mechanical Plant

Due consideration must be given to the nature of the primary noise sources when setting criteria. Criteria for noise from these sources, with the exception of additional vehicular traffic on public roads, will be set in terms of the $L_{Aeq,T}$ parameter (the equivalent continuous sound level). In relation to day-to-day operational phase noise impacts on off-site residential locations WCC would typically apply the following condition to a development of this nature:

Noise levels from the proposed development shall not be so loud, so continuous, so repeated, of such duration or pitch or occurring at such times as to give reasonable cause for annoyance to a person in any premises in the neighbourhood or to a person lawfully using any public place. In particular, the rated noise levels from the proposed development shall not constitute reasonable grounds for complaint as provided for in B.S. 4142. Method for rating industrial noise affecting mixed residential and industrial areas.

Reason: In order to ensure a satisfactory standard of development, in the interests of residential amenity.

This wording is most relevant to the noise emissions from mechanical plant serving the development and careful consideration will be given to this issue as part of the detailed assessment.

Guidance from WCC*: Methods for Rating and Assessing Industrial and Commercial Sound*. This guidance is the industry standard method for analysing building services plant noise emissions to residential receptors and is the document typically used by WCC in their standard planning conditions and also in complaint investigations.

BS 4142 describes methods for rating and assessing sound of an industrial and / or commercial nature. The methods described in this British Standard use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident.
For an appropriate *BS 4142* assessment it is necessary to compare the measured external background noise level (i.e. the $L_{A90,T}$ level measured in the absence of plant items) to the rating level ($L_{Ar,T}$) of the various plant items, when operational. Where noise emissions are found to be tonal, impulsive in nature or irregular enough to attract attention, *BS 4142* also advises that a penalty be applied to the specific level to arrive at the rating level.

The subjective method for applying a penalty for tonal noise characteristics outlined in *BS 4142* recommends the application of a 2dB penalty for a tone which is just perceptible at the noise receptor, 4dB where it is clearly perceptible, and 6dB where it is highly perceptible.

The following definitions as discussed in BS 4142 as summarised in Table 8.4:

Noise	Description
ambient noise level, $L_{Aeq,T}$	is the noise level produced by all sources including the sources of concern, i.e. the residual noise level plus the specific noise of mechanical plant, in terms of the equivalent continuous A-weighted sound pressure level over the reference time interval [T]
residual noise level, $L_{Aeq,T}$	is the noise level produced by all sources excluding the sources of concern, i.e. the ambient sound remaining at the assessment location when the specific sound source is suppressed to such a degree that it does not contribute to the ambient sound, in terms of the equivalent continuous A-weighted sound pressure level over the reference time interval [T]
specific noise level, $L_{Aeq,T}$	is the sound level associated with the sources of concern, i.e. noise emissions solely from the mechanical plant, in terms of the equivalent continuous A-weighted sound pressure level over the reference time interval [T]
rating level, $L_{Ar,T}$	is the specific sound level plus any adjustments for the characteristic features of the sound (e.g. tonal, impulsive, or irregular components)
background noise level, $L_{A90,T}$	is the sound pressure level of the residual noise that is exceeded for 90% of the time period T

Table 8-4 Tonal Noise Characteristics

If the rated plant noise level is +10dB or more above the pre-existing background noise level, then this indicates that complaints are likely to occur and that there will be a significant adverse impact. A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context. The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact.

Traffic Noise

Given that traffic to and from the development will make use of existing roads already carrying traffic volumes, it is appropriate to consider the increase in traffic noise level that arises as a result of vehicular movements associated with the development.

In order to assist with the interpretation of the noise associated with vehicular traffic on public roads, Table 8.5 offers guidance as to the likely impact associated with any particular change in traffic noise level (Source DMRB, 2011). It shows that small changes in noise levels are not normally noticeable, whereas an increase of 10dB would be described as a doubling of loudness. In summary the assessment looks at the impact with and without development at the nearest noise sensitive locations.

Change in Sound Level (dB)	Subjection Reaction	Magnitude of Impact	EPA Glossary of Effects[1]
0	None	No Change	Neutral
0.1 - 2.9	Imperceptible	Negligible	Imperceptible
3-4.9	Perceptible	Minor	Slight
5 - 9.9	Up to a doubling of loudness	Moderate	Moderate
10+	Over a doubling of loudness	Major	Significant

Table 8-5 Significance in Change of Noise Level

[1]EPA Guidelines on the Information to be contained in Environmental Impact Assessment Reports, (Draft August 2017)

Mechanical Plant

During the operational phase, potential noise sources relate to building and mechanical services used to serve the proposed development. In order to set appropriate operational noise criteria for these potential sources, guidance has been taken from BS 8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings. The recommended internal noise levels for dwellings are set out in Table 8.6.

In order to set an external noise level based on the internal criteria noted above, this is done by factoring in the degree of noise reduction afforded by a partially open window, which BS 8233 suggests as 15dB. Using this value, external noise levels of 50 and 45dB $L_{Aeq,T}$ are considered appropriate for day and night-time periods respectively. The time period for day-time noise levels has been set over a 1-hour period to provide a robust criterion. Given the higher sensitivity of people to noise at night, the time period for night-time levels is set as 15mins. In this instance, the following criteria relate to the nearest noise sensitive properties external to the site.

- Daytime (07:00 to 23:00hrs) 50dB $L_{Aeq,1hr}$
- Night-time (23:00 to 07:00hrs) 45 dB $L_{Aeq,15min}$

For an appropriate BS 4142 assessment it is necessary to compare the measured external background noise level (i.e. the LA90,T level measured in the absence of plant items) to the rating level (LAr,T) of the various plant items, when operational. Where noise emissions are found to be tonal, impulsive in nature or irregular enough to attract attention, BS 4142 also advises that a penalty be applied to the specific level to arrive at the rating level.

Inward Noise Impact

The Professional Guidance on Planning & Noise (ProPG) report was published in May 2017. This guidance was prepared by a working group comprising members of the Association of Noise Consultants (ANC), the Institute of Acoustics (IOA) and the Chartered Institute of Environmental Health (CIEH). Although not a government document, since its adoption it has been generally considered as a best practice guidance and has been widely adopted in the absence of equivalent Irish guidance.

The ProPG outlines a systematic risk based 2 Stage approach for evaluating noise exposure on prospective sites for residential development. The two primary stages of the approach can be summarised as follows:

- **Stage 1** - Comprises a high-level initial noise risk assessment of the proposed site considering either measured and or predicted noise levels; and
- **Stage 2** - Involves a full detailed appraisal of the proposed development covering four '*key elements*' that include:
  - **Element 1** - Good Acoustic Design Process.
  - **Element 2** - Noise Level Guidelines.
  - **Element 3** - External Amenity Area Noise Assessment; and
  - **Element 4** - Other Relevant Issues.

The initial noise risk assessment is intended to provide an early indication of any acoustic issues that may be encountered. It calls for the categorisation of the Site as a negligible, low, medium or high risk based on the pre-existing noise environment. Figure 8.1 presents the basis of the initial noise risk assessment; it provides appropriate risk categories for a range of continuous noise levels either measured and / or predicted onsite.

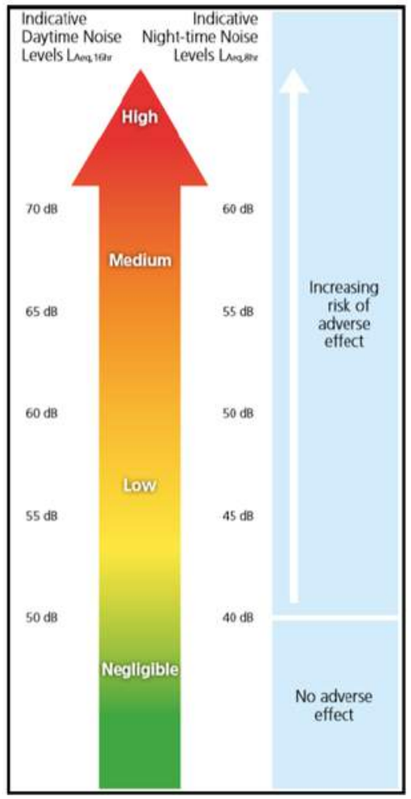

Figure 8-1 ProPG Stage 1- Initial Noise Risk Assessment

A site should not be considered a negligible risk if more than 10 L_{AFmax} events exceed 60dB during the night period and the site should be considered a high risk if the L_{AFmax} events exceed 80dB more than 20 times a night. *Element 2* of the ProPG document sets out recommended internal noise targets derived from *BS 8233 (2014).* The recommended

indoor ambient noise levels are set out in Table 8.5 and are based on annual average data, that is to say they omit occasional events where higher intermittent noisy events may occur.

Activity	Location	(07:00 to 23:00)	(23:00 to 07:00)
Resting	Living room	35 dB $L_{Aeq,16hr}$	-
Dining	Dining room / area	40 dB $L_{Aeq,16hr}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hr}$	30 dB $L_{Aeq,8hr}$ 45 dB $L_{Amax,T*}$

Table 8-6 ProPG Internal Noise Levels

***Note The document comments that the internal LAFmax, T noise level may be exceeded no more than 10 times per night without a significant impact occurring**.

In addition to these absolute internal noise levels ProPG provides guidance on flexibility of these internal noise level targets. For instance, in cases where the development is considered necessary or desirable, and noise levels exceed the external noise guidelines, then a relaxation of the internal L_{Aeq} values by up to 5dB can still provide reasonable internal conditions.

The ProPG guidance provides the following advice with regards to external noise levels for amenity areas in the development:

'The acoustic environment of external amenity areas that are an intrinsic part of the overall design should always be assessed and noise levels should ideally not be above the range 50-55dB LAeq,16hr.'

Operational Phase – Vibration Assessment Criteria

Considering the proposed development, there are no vibration sources associated with the operational phase. Operational criteria relating to this issue are therefore not included.

8.3 RECEIVING ENVIRONMENT

A detailed development description is included the statutory notices and chapter 3 of the EIAR.

Noise Monitoring Equipment

The equipment used during the baseline noise and environmental noise survey was installed and removed by Traynor Environmental. The noise measurements were carried out using the following equipment mentioned in Table 8.7. The instruments were checked and calibrated before and after the survey with no significant drift noted.

Instrumentation Details				
Manufacturer	**Instrument**	**Calibrated by**	**Calibration Certificate Ref**	**Last Laboratory Calibration**
Larson Davis Sound Expert LxT	(Serial No.5595)	Environmental Measurements, Unit 12, Tallaght Business Park, Dublin 24	2018004505	8th March 2018
Larson Davis Sound Expert 831	(Serial No.3913)	Environmental Measurements, Unit 12, Tallaght Business Park, Dublin 24	31417	12th June 2018
Larson Davis Sound Expert LxT	(Serial No.5901)	Environmental Measurements, Unit 12, Tallaght Business Park, Dublin 24	2019007353	30th April 2019

Table 8-7 Instrumentation Details Noise Monitoring Locations

Measurement Parameters

The noise survey results are presented in terms of the following parameters:

L_{Aeq} This is the equivalent continuous sound level. It is an average and is used to describe a fluctuating noise in terms of a single noise level over the sample period. The closer the Laeq value is to either the L_{A10} or L_{A90} value indicates the relative impact of the intermittent sources and their contribution. The relative spread between the values determines the impact of intermittent sources such as traffic on the background.

L_{A90} This is the sound that is exceeded for 90% of the sample period. It is typically used as a descriptor for traffic noise.

L_{A10} This is the sound that is exceeded for 10% of the sample period. It is typically used as a descriptor for traffic noise.

L_{AFMIN} is the instantaneous minimum sound level measured during the sample period using the 'F' time weighting.

L_{AFmax} is the instantaneous maximum sound level measured during the sample period using the 'F' time weighting.

The *"A:'* suffix denotes the fact that the sound levels have been "A-weighted" in order to account for the non-linear nature of human hearing. All sound levels in this report are expressed in terms of decibels (dB) relative to $2x10^{-5}$ Pa.

Baseline Noise Survey

The subject site is located in Clonattin, Gorey, Co. Wexford approximately 625m west of the M11 motorway. Bounded on the west by Hillcrest Drive Housing estate and the IDA Industrial Estate. The site is bounded on the east by agricultural fields and the M11 and to the north by Clonattin Road which lies on the development boundary. The Courtown road (R742) runs along the south of the development. The Mill lands residential area and a cinema is located south west and south east of the site boundary

A baseline noise survey has been conducted at the site in order to quantify the existing noise environment. The survey was conducted in general accordance with *ISO 1996: 2017: Acoustics - Description, Measurement and Assessment of Environmental Noise*. Specific details are set out below.

Three measurement locations were selected as shown in Figure 8.2 below and described below.

- **Location A** - located on the west boundary.
- **Location B** - located on the south boundary.
- **Location C** - located on the east boundary.

Figure 8-2 Baseline nose monitoring locations

Survey Periods

Baseline noise survey measurements were conducted at Locations A – C over the following survey periods:

Location	Period	
	Start Time/Date	**End Time/Date**
A	23:00hrs on 08/11/19	22:30hrs on 10/11/19
B	23:00hrs on 08/11/19	22:30hrs on 10/11/19
C	23:00hrs on 08/11/19	22:30hrs on 10/11/19

Table 8-8 Baseline survey dates and times

Survey Results and Discussion

Location A

Date	L_{Aeq}	L_{AFmax}	$L_{AF10.00}$	$L_{AF90.00}$
08/11/2019	43	54	45	39
09/11/2019	45	56	47	42
Average	**44**	**55**	**46**	**41**

Table 8-9 Location A: Average Night time Noise

Date	L_{Aeq}	L_{AFmax}	$L_{AF10.00}$	$L_{AF90.00}$
09/11/2019	49	61	51	46
10/11/2019	46	59	47	43
Average	**48**	**60**	**49**	**45**

Table 8-10 Location A: Average Day time Noise

The noise environment at the measurement location A was dominated by intensive short duration noise events which are characteristic of road traffic noise from the Clonattin Village Road and the Courtown Road (R742). Daytime noise levels measured at 48 dB(A) L_{Aeq} and background noise levels measured 45 dB(A) L_{A90}. Night time noise levels were measured at 44 dB(A) L_{Aeq} and the measured background noise level was 41 dB(A) $L_{A90.}$

Location B

Date	L_{Aeq}	L_{AFmax}	$L_{AF10.00}$	$L_{AF90.00}$
08/11/2019	42	55	45	37
09/11/2019	40	53	43	35
Average	**41**	**54**	**44**	**36**

Table 8-11 Location B: Average Night time Noise

Date	L_{Aeq}	L_{AFmax}	$L_{AF10.00}$	$L_{AF90.00}$
09/11/2019	47	59	49	44
10/11/2019	45	58	47	42
Average	**46**	**59**	**48**	**43**

Table 8-12 Location B: Average Day time Noise

The noise environment at the measurement location B indicates that the measured noise was dominated by intensive short duration noise events which are characteristic of road traffic noise from Courtown Road (R742), M11 Motorway and the neighbouring housing estate roads. Daytime noise measured at 46 dB(A) L_{Aeq} and background noise levels measured 43 dB(A) L_{A90}. Night time measured at 41 dB(A) L_{Aeq} and the measured background noise level was 36 dB(A) $L_{A90.}$

Location C

Date	L_{Aeq}	L_{AFmax}	$L_{AF10.00}$	$L_{AF90.00}$
08/11/2019	41	53	48	35
09/11/2019	39	53	43	32
Average	**40**	**53**	**46**	**34**

Table 8-13 Location C: Average Night time Noise

Date	L_{Aeq}	L_{AFmax}	$L_{AF10.00}$	$L_{AF90.00}$
09/11/2019	45	62	46	41
10/11/2019	45	62	46	40
Average	**45**	**62**	**46**	**41**

Table 8-14 Location C: Average Day time Noise

The noise environment at the measurement location C indicate that the measured noise was dominated by intensive short duration noise events which are characteristic of road traffic noise from the neighbouring housing estate roads and M11. Daytime noise measured at 45 dB(A) L_{Aeq} and background noise levels measured 41 dB(A) L_{A90}. Night time measured at 40 dB(A) L_{Aeq} and the measured background noise level was 34 dB(A) $L_{A90.}$

Discussion and conclusions

Location A, B and C all indicate that the dominate intensive short duration noise events are characteristic of road traffic noise from the neighbouring roads. The baseline noise environment will not require additional constraints to be imposed on the majority of the proposed project outside of the normal criteria applicable to a development of the scale and nature of that proposed.

Environmental Noise Survey

An environmental noise survey has been conducted at the site in order to quantify the existing noise environment. The survey was conducted in general accordance with ISO 1996: 2017: *Acoustics - Description, Measurement and Assessment of Environmental Noise*. Four measurement locations were selected with their specific details as shown in Figure 8.3 and described in Table 8.15.

Noise Measurement Location	Description
Location NM1	Located on Courtown Road (R742) south of the proposed site and 0.5km east of the Gorey railway line.
Location NM2	Location on Clonattin Road north west of the proposed site adjacent to St. Michaels cemetery and 200m east of the Gorey railway line.
Location NM3	Location on Clonattin Road north east of the proposed site and adjacent to residential housing.
Location NM4	Location approximately 500m south of proposed development and 400m west of the motorway (M11).

Table 8-15 Description of Noise Measurement Location

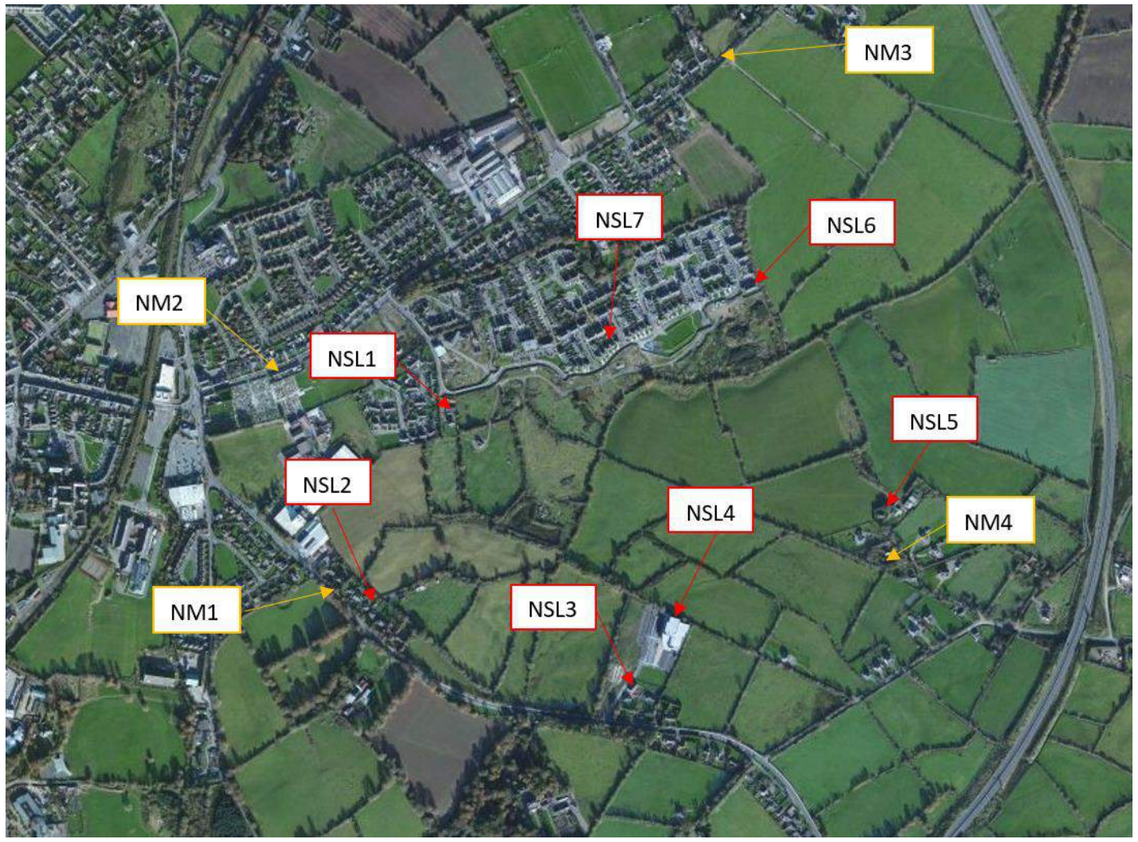

Figure 8-3 Noise Monitoring Locations (Image Source: Ordnance Survey Ireland-OSI.ie)

**NM: Noise measurement, NSL: Noise Sensitive Location*

Survey Periods
The noise survey was carried out at six locations over the following period:
08:00hrs to 17:15hrs on 11th November 2019
For the purpose of this assessment, daytime is taken to be between 07:00 and 23:00. The weather during the daytime survey period was minimal rainfall 0.6mm and overcast with mean windspeeds at 10 Knots and daytime temperature of 8.3C. (Weather information from Met Éireann Oak Park open Tucson weather station).

Survey Results and Discussion
The noise survey results for the four monitoring locations are summarised in Tables 8.16 – 8.20.

Location NM1

Time		Measured Noise Levels (dB re. $2x10^{-5}$Pa)				
		L_{Aeq}	LA_{max}	LA_{min}	$LA_{10.00}$	$LA_{90.00}$
Day	08:00	63	80	47	64	50
	11:00	61	78	45	62	49
	14:30	62	80	46	63	50

Table 8-16 Measured Noise Levels at NM1

NM1 was located at the residential housing just off Courtown Road (R742) southwest of the proposed development. The ambient noise environment was primarily made up of background traffic noise from the Courtown Road (R742). Other noise sources were typical activities within the residential housing area, these include dogs barking, lawnmowers and children playing. The L_{Aeq} ranged was from 61 to 63 dB. The L_{A90} ranged was 49 to 50 dB.

Location NM2

Time		Measured Noise Levels (dB re. $2x10^{-5}$Pa)				
		L_{Aeq}	LA_{max}	LA_{min}	$LA_{10.00}$	$LA_{90.00}$
Day	08:45	65	83	55	67	57
	11:45	62	83	53	64	56
	15:15	61	81	53	63	55

Table 8-17 Measured Noise Levels at NM2

The dominant noise source at this location was traffic at the roundabout on the converging roads: Esmonde Street, Courtown Road (R742) and Clonattin Road. Background noise from these three roads was a significant noise source at this location. Other minor noise sources include gardening activities from the nearby Hazelwood housing estate to the north. The L_{Aeq} ranged from 61 to 65 dB. The L_{A90} ranged from 55 to 57 dB.

Location NM3

Time		Measured Noise Levels (dB re. $2x10^{-5}$Pa)				
		L_{Aeq}	LA_{max}	LA_{min}	$LA_{10.00}$	$LA_{90.00}$
Day	09:30	58	80	47	60	49
	12:00	60	81	48	62	50
	16:00	61	80	49	63	52

Table 8-18 Measured Noise Levels at NM3

The existing noise environment at NM3 is in the residential housing area along the Clonattin Road. This includes the background noise from the Clonattin Road traffic as significant noise source at this location. People walking and talking was also a contributing noise source. The L_{Aeq} ranged from 58 to 61 dB. The L_{A90} ranged from 49 to 50 dB. The variation in L_{Aeq} can be attributed to the cars on the road near the measurement location.

Location NM4

Time		Measured Noise Levels (dB re. $2x10^{-5}$Pa)				
		L_{Aeq}	LA_{max}	LA_{min}	$LA_{10.00}$	$LA_{90.00}$
Day	10:15	54	57	53	56	53
	12.45	53	56	48	55	50
	16:45	52	55	48	54	50

Table 8-19 Measured Noise Levels at NM4

NM4 was located in the open area approximately 400m east of the M11 motorway, and 500m west of the proposed site. The ambient noise environment was primarily made up of background traffic noise from the Courtown Road (R742) and the motorway M11. Other noise sources included vehicle movement at the nearby houses. The ambient noise fluctuated from volume of road traffic on the local roads. The L_{Aeq} ranged from 52 to 54 dB. The L_{A90} ranged from 50 to 53 dB.

Conclusion

The results of the environmental noise survey study suggest the noise environment will not require additional constraints to be imposed on the majority of the proposed project outside of the normal criteria applicable to a development of the scale and nature of that proposed.

8.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

'The proposed strategic housing development at this site in Clonattin, Gorey will include the demolition of the existing buildings and will provide 363 no. residential units, a creche, public open space, a new access road connecting to Courtown Road. All associated site development works and services provisions including parking, bin storage, substations, landscaping and all services required to facilitate the proposed development. A full description is provided in the statutory notices and in Chapter 3 of the EIAR.'

When considering a development of this nature, the potential noise and vibration impact on the surroundings is considered for each of two distinct stages:

- Construction Phase
- Operational Phase

The construction phase will involve excavation over the development site, landscaping, construction of internal roads, excavation of foundations, building and transport of materials to site using the local road network.

The primary sources of outward noise in the operational context are deemed to be long term in duration and will comprise traffic movements to site using the existing road network. (These issues are discussed in detail in the following sections).

8.5 POTENTIAL IMPACTS

The potential noise and vibration impacts associated with the construction and operational phases of the proposed development are discussed in the following sections.

Construction Phase

Noise

A review of the baseline noise survey and the threshold values detailed in Table 8.1 indicates that the daytime noise guidance limit for construction noise is **65dB L_{Aeq}**. It is assumed that construction works will take place during normal working hours only. During the construction phase of the proposed development, a variety of items of plant will be in use, such as excavators, dumper trucks, compressors and generators.

Due to the nature of daytime activities undertaken on a construction site of this nature, there is potential for generation of significant levels of noise. The flow of vehicular traffic to and from a construction site is also a potential source of relatively high noise levels.

Considering the outline construction programme, it is possible to predict typical noise levels using guidance set out in BS 5228-1:2009+A1:2014. Table 8.20 outlines typical plant items and associated noise levels that are anticipated for various phases of the construction programme.

Activity	Item of Plant (BS5228 Ref)	Noise level at 10m Distance (dB $L_{Aeq\ (1hour)}$)
Site Preparation (Phase 1)	Wheeled Loader Lorry (D3 1)	75
	Track Excavator (C2 22)	72
	Dozer (C2.13)	78
	Dump Truck (C4.2)	78
	Cumulative Site Preparation	82
General Construction (Phase 2)	Dump Truck (C2.30)	79
	Tracked excavator (02.21)	71
	Compressor (D7.08)	70
	Telescopic Handler (C4.54)	79
	Handheld Circular Saw (C4.72)	79
	Diesel Generator (C4.76)	61
	Internal Fit out	70
	Cumulative General Construction	84
Road Works/Landscaping (Phase 3)	Asphalt Paver & Tipping Lorry (C5.30)	75
	Electric Water Pump (C5.40)	68
	Vibratory Roller (C5.20)	75
	Cumulative General Landscaping and Road Work	78

Table 8-20 Predicted Noise Levels from Key Pieces of Equipment

The calculations also assume that the equipment will operate for 66% of the 12-hour working day (i.e. 8 hours) and that a standard site hoarding, typically 2.4m height will be erected around the perimeter of the construction site for the duration of works. It is assumed that construction works will take place during normal working hours only. The closest noise sensitive locations (NSL) have been identified as shown in Figure 8.4 and described in table 8.21.

Noise Sensitive Locations	Description
Location NSL1	This represents Hillcrest Drive housing estate and a residential house located to the west of the proposed site approximately 10m from the nearest significant site work
Location NSL2	This represents a small cluster of houses on Courtown Road located along the west south-west of the proposed site approximately 200m from the nearest significant site works.
Location NSL3	This represents Small Wonders Creche & Pre School located just off the Courtown Road. Approximately 300m from the nearest significant site work from the south of the proposed site.
Location NSL4	This represents a cinema just off the Courtown Road. Approximately 200m from the nearest significant site works from the south of the proposed site.
Location NSL5	This represents residential housing just off the Raheenagurren Road to the east of the proposed site approximately 370m from the nearest significant site works.
Location NSL6	This represents 67-72 The Green, Clonattin Village housing estate located to the north of the proposed site approximately 8m from the nearest significant site works.
Location NSL7	This represents The Close, The Avenue, The Park & The Green Clonattin Village housing estates located to the north of the proposed site approximately 15m from the nearest significant site works.

Table 8-21 Description of Noise Measurement Location

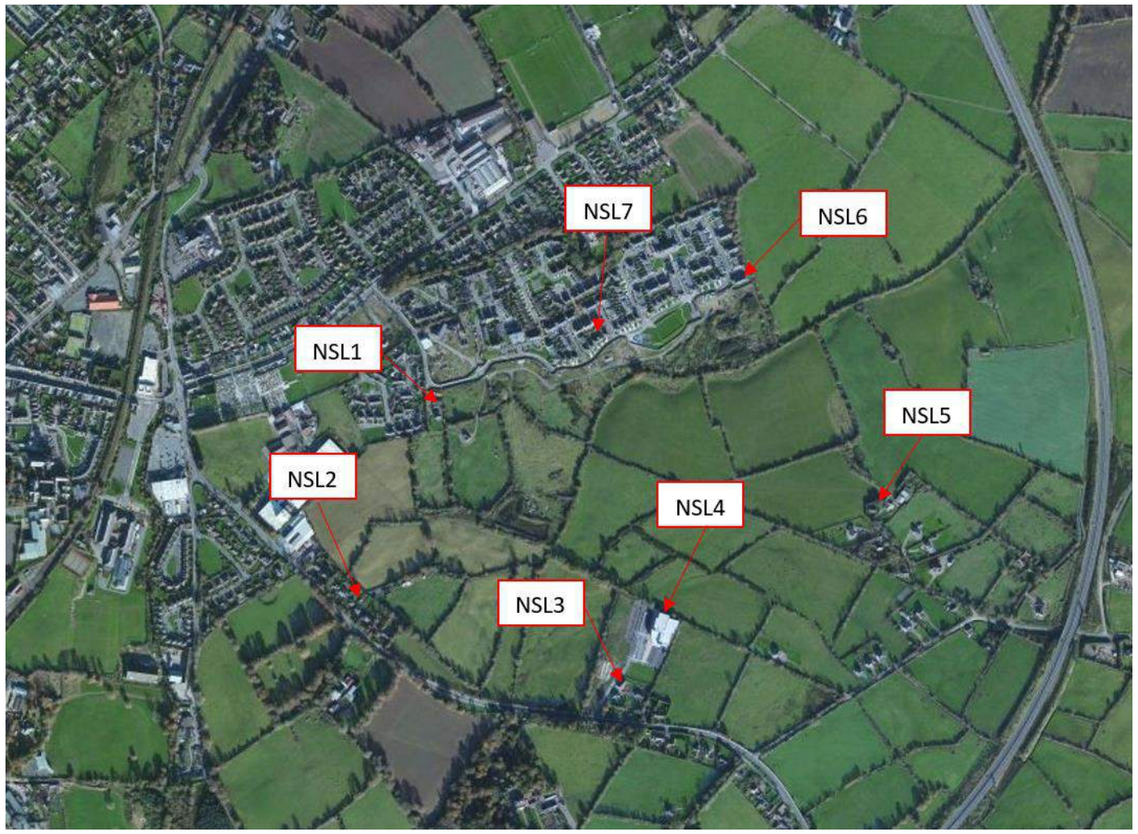

Figure 8-4 Site Context & Noise Assessment Locations (Image Source: Google Maps)

Predicted Noise Level at Various Locations

In order to assess the level of Environmental noise associated with the proposed development a number of noise sensitive locations were considered. Figure 8.4 details the locations from the nearest façade of the neighbouring building to the proposed development.
Table 8.22 presents the predicted daytime noise levels from an indicative construction period at these noise sensitive locations (NSLs).

Construction Phase	Item of Plant (BS5228-1 Ref)	L_{Aeq} at distance (m)						
		NSL1	NSL2	NSL3	NSL4	NSL5	NSL6	NSL7
		10m	200m	300m	200m	370m	8m	15m
		dB	dB	dB	dB	dB	dB	dB
Site Preparation (Phase 1)	Wheeled Loader Lorry (D3 1)	75	52	50	52	49	77	68
	Track Excavator (C2 22)	72	49	47	49	46	74	65
	Dozer (C2.13)	78	55	53	55	52	80	71
	Dump Truck (C4.2)	78	55	53	55	52	80	71
	Cumulative Site Preparation	**82**	**59**	**57**	**59**	**56**	**84**	**75**
General Construction (Phase 2)	Dump Truck (C2.30)	79	56	54	56	53	81	72
	Tracked excavator (02.21)	71	48	46	48	45	73	64
	Compressor (D7.08)	70	47	45	47	44	72	63
	Telescopic Handler (C4.54)	79	56	54	56	53	81	72
	Handheld Circular Saw (C4.72)	79	56	54	56	53	81	72
	Diesel Generator (C4.76)	61	38	36	38	35	63	54
	Internal Fit out	70	17	45	47	44	72	63
	Cumulative General Construction	**84**	**61**	**59**	**61**	**58**	**86**	**77**
Road Works/ Landscaping (Phase 3)	Asphalt Paver & Tipping Lorry (C5.30)	75	52	50	52	49	77	68
	Electric Water Pump (C5.40)	68	45	43	45	42	70	61
	Vibratory Roller (C5.20)	75	52.	50	52	49	76	68
	Cumulative General Landscaping and Road Work	**78**	**55**	**53**	**55**	**52**	**80**	**71**

Table 8-22 Indicative Construction Noise Levels at Nearest Noise Sensitive Locations

Taking into account these assumptions and allowing for the attenuation of sound over distance, the predicted construction noise level at the nearest sensitive properties is above the relevant construction noise criteria, i.e. the level at which a potential significant impact could be expected to occur, at noise sensitive locations within 15m of site work. Also, considering the proximity of NSL1 (approx. 10m at nearest point), NSL6 (approx. 8m at nearest point) and NSL7 (approx. 15m at nearest point) has a potential significant impact at all construction phases in the absence of mitigation.

Review of the predicted noise levels at these locations are above the criteria at which a significant impact is deemed to occur (65dB $L_{Aeq,T}$) and therefore, in the absence of noise mitigation, a **negative**, **significant** and **short-term** impact is likely.

At greater distances (property represented by NSL2, NSL3, NSL4 & NSL5) predicted construction noise levels are lower for site preparation, general construction and road works/Landscaping, therefore any impact is expected to be **negative, moderate and short-term.**

Construction Traffic

The noise levels associated with mobile plant items such as concrete mixer trucks, loaders etc. operational on site have been included as part of the construction noise assessment and calculated noise levels in Table 8.23. Consideration should also be given to the addition of construction traffic along the site access routes. Access to the development site for construction traffic will be via the Courtown (R742) and Clonattin Village Roads to the north and south of the proposed development.

It is possible to calculate the noise levels associated with the passing vehicle using the following formula.

$$L_{Aeq,T} = L_{AX} + 10\log_{10}(N) - 10\log_{10}(T) + 10\log_{10}(r_1/r_2)\text{dB}$$

Where:

$L_{Aeq,T}$ = is the equivalent continuous sound level over the time period Tin seconds.
L_{AX} = is the "A-weighted" Sound Exposure Level of the event considered(dB).
N = is the number of events over the course of time period T.
r_1= is the distance at which LAX is expressed.
r_2= is the distance to the assessment location

A calculation distance of 5m from the road has been used to assess noise levels at the closest buildings along the construction routes. The mean value of Sound Exposure Level for truck moving at low to moderate speeds (i.e. 15 to 45km/hr) is of the order of 82dB L_{ax} at a distance of 5 metres from the vehicle. This figure is based on a series of measurements conducted under controlled conditions. Construction vehicle noise are predicted (table 8.23 for peak hours associated with each key phase. Table 8.23 summarises the calculated noise level associated with passing haul vehicles during each phase, assuming the peak hour flows per day.

Construction Phase	Road	No. of Trucks/peak hour	Calculated Noise at edge of road (5m),dB $L_{Aeq,\ 1hr}$
Phase 1	Courtown (R742)	3	55
	Clonattin Village Road	3	52
Phase 2	Courtown (R742)	2	53
	Clonattin Village Road	3	55
Phase 3	Courtown (R742)	2	53
	Clonattin Village Road	2	53

Table 8-23 Calculated Construction Traffic Noise Levels at Edge of Road

The calculated noise levels associated with the various phases are in the range of 53 to 55dB $L_{Aeq,1hr}$. The calculated noise levels are below the construction noise criterion of 65dB. In addition, it should be noted that, in order to assess a worst- case scenario, a large proportion of the daily vehicle numbers have been assumed to arrive/depart over an hour-long period.

Vibration

The main potential source of vibration during the construction programme is associated ground-breaking activities. Considering the low vibration levels at very close distances to the ground-breaking activities, vibration levels at the nearby buildings are not expected to pose any significance in terms of cosmetic or structural damage to any of the residential or sensitive buildings in proximity to the development works. In addition, the range of vibration levels is typically below a level which would cause any disturbance to occupants of nearby buildings.

It is anticipated that excavations will be made using standard excavation machinery, which typically do not generate appreciable levels of vibration close to the source. Taking this into account and considering the distance that these properties are from the works and the attenuation of vibration levels over distance, the resultant vibration levels are expected to be well below a level that would cause disturbance to building occupants or even be perceptible.
The associated impact with these activities is considered to be **neutral** and **imperceptible.**

Operational Phase

Noise

There are four primary potential sources of noise associated with the development once operational these are:

- Additional vehicular traffic on public roads
- Mechanical plant noise
- Residential
- Creche

Each of these primary noise sources is addressed in turn in the following sections.

Note: There is no significant source of vibration associated with the operational phase of the proposed development.

Additional Traffic on Adjacent Roads

During the operational phase of the proposed development, there will be an increase in vehicular traffic associated with the site on some surrounding roads.

A traffic impact assessment relating to the proposed development has been prepared by Cronin & Sutton Consulting Group, as part of this EIAR. Using this information and Project Appraisal Guidelines from Transport Infrastructure Ireland related noise impacts of the road links has been assessed.

Table 8.24 displays the predicted change in noise level at different road links around the site for the year of opening and the design year using the Annual Average Daily Traffic (AADT).

Road Links	2023 Year Base		
	AADT Without Development	AADT With Development	Change in Noise Level
Clonattin Village	2,589	4,418	0.3
Clonattin Road	6,581	6,649	0.0
R742 (Courtown Road)	7,611	6,568	-0.2
Road Links	**2038 Year Base**		
	AADT Without Development	AADT With Development	Change in Noise Level
Clonattin Village	3,162	4,990	0.3
Clonattin Road	7,983	8,052	0.0
R742 (Courtown Road)	9,273	8,230	-0.2

Table 8-24 Predicted Change in Noise Level associated with Vehicular Traffic – Existing Road Network

With reference to Table 8.5, the predicted change in noise level associated with additional traffic accessing the proposed development, for the existing road network, has a negligible effect. The impact is therefore **imperceptible** and **long term.**

Mechanical Plant

It is expected that the principal items of building and mechanical services plant will be associated with the running of the apartments. These items will be selected at a later stage, however, they will be designed and located so that there is no negative impact on sensitive receivers within the development itself. The services plant will be designed/attenuated to meet the relevant plant noise criteria for day and night-time periods at nearby sensitive receivers as set out in Section (Human Perception)

Residential
The noise impact of the residential aspect of the development on the receiving environment will be slight. It will be limited to internal vehicle movements entering and exiting the development, and residents using private green areas which will be screened by the houses and apartment blocks.

Creche
The Creche is located to the south of the site will serve the residents of the development. The opening hours of the creche is expected to be from 7am – 7pm Monday to Friday. No early morning noise associated with the creche is expected before 7am. The noise of children playing in any environment is regarded as a natural aspect of life in any area of a development.

Considering that sensitive receivers within the development are much closer than off-site sensitive receivers, once the relevant noise criteria is achieved within the development it is expected that there will be no negative impact at sensitive receivers off site.

8.6 POTENTIAL CUMULATIVE IMPACTS

Construction Phase

During the construction phase of the proposed development, construction noise on site will be localised and will therefore likely be the primary noise source at the nearest noise sensitive receivers. In the event that construction activities associated with the majority of developments noted above occur simultaneous to the proposed development, they are at sufficient distances such that the cumulative noise levels will remain dominated by the localised works referred to in Table 8.22.

In the event that works on site and works associated with proposed or permitted developments were ongoing simultaneously, there is potential for cumulative noise impacts at all NSLs. Under this scenario, construction activities will be audible at a number of facades of the residential areas due to their location with respect to both areas of works.

The contractor will be required to control noise and vibration impacts associated with this development in line with the guidance levels included in Table 8.1 and Table 8.2 and follow the best practice control measures within BS 8228-2. The impact from any construction works associated with the other developments listed above is considered to be imperceptible as these works are expected to take place at large distances to the most exposed noise sensitive receivers to the proposed development under assessment.

Operational Phase

The operational phase of the development listed above have the potential to generate additional traffic on the roads in the vicinity of the local area. These additional vehicle movements have been considered in the traffic assessment in the operational phase of the potential impact section. The cumulative impact of this source is determined to be imperceptible and long term.

8.7 MITIGATION MEASURES

Construction Phase - Noise

With regard to construction activities, best practice control measures for noise and vibration from construction sites are found within BS 5228 (2009 +A1 2014) *Code of Practice for Noise and Vibration Control on Construction and Open Sites Parts 1 and 2*. Whilst construction noise and vibration impacts are expected to vary during the construction phase depending on the distance between the activities and noise sensitive buildings, the contractor will ensure that all best practice noise and vibration control methods will be used, as necessary in order to ensure impacts at off-site noise sensitive locations are minimised.

The best practice measures set out in BS 5228 (2009) Parts 1 and 2 includes guidance on several aspects of construction site mitigation measures, including, but not limited to:

- Selection of quiet plant.
- Noise control at source.
- Screening.
- Liaison with the public
- Monitoring

A detailed comment is offered on these items in the following paragraphs. Noise control measures that will be considered include the selection of quiet plant, enclosures and screens around noise sources, limiting the hours of work and noise and vibration monitoring, where required.

Selection of Quiet Plant
This practice is recommended in relation to static plant such as compressors and generators. It is recommended that these units be supplied with manufacturers' proprietary acoustic enclosures. The potential for any item of plant to generate noise will be assessed prior to the item being brought onto the site. The least noisy item should be selected wherever possible. Should a particular item of plant already on the site be found to generate high noise levels, the first action should be to identify whether or not said item can be replaced with a quieter alternative.

Noise Control at Source
If replacing a noisy item of plant is not a viable or practical option, consideration will be given to noise control "at source". This refers to the modification of an item of plant or the application of improved sound reduction methods in consultation with the supplier. For example, resonance effects in panel work or cover plates can be reduced through stiffening or application of damping compounds; rattling and grinding noises can often be controlled by fixing resilient materials in between the surfaces in contact.

Referring to the potential noise generating sources for the works under consideration, the following best practice mitigation measures should be considered:

- Site compounds will be located in excess of 30m from noise sensitive receptors within the site constraints. The use lifting bulky items, dropping and loading of materials within these areas should be restricted to normal working hours.
- For mobile plant items such as dump trucks, excavators and loaders, the installation of an acoustic exhaust and/or maintaining enclosure panels closed during operation can reduce noise levels by up to 10dB. Mobile plant should be switched off when not in use and not left idling.

- For steady continuous noise, such as that generated by diesel engines, it may be possible to reduce the noise emitted by fitting a more effective exhaust silencer system or utilising an acoustic canopy to replace the normal engine cover. For concrete mixers, control measures should be employed during cleaning to ensure no impulsive hammering is undertaken at the mixer drum.
- For all materials handling ensure that materials are not dropped from excessive heights, lining drops chutes and dump trucks with resilient materials.
- For compressors, generators and pumps, these can be surrounded by acoustic lagging or enclosed with in acoustic enclosures providing air ventilation.
- Demountable enclosures can also be used to screen operatives using hand tools and will be moved around site as necessary.
- All items of plant should be subject to regular maintenance. Such maintenance can prevent unnecessary increases in plant noise and can serve to prolong the effectiveness of noise control measures.

Screening
Screening is an effective method of reducing the noise level at a receiver location and can be used successfully as an additional measure to all other forms of noise control. Construction site hoarding will be constructed around the site boundaries as standard. The hoarding will be constructed use standard plywood material to provide adequate sound insulation.

In addition, careful planning of the site layout will also be considered. The placement of site buildings such as offices and stores will be used, where feasible, to provide noise screening when placed between the source and the receiver.

Liaison with the Public
A designated environmental liaison officer will be appointed to site during construction works. Any noise complaints should be logged and followed up in a prompt fashion by the liaison officer. In addition, where a particularly noisy construction activity is planned or other works with the potential to generate high levels of noise, or where noisy works are expected to operate outside of normal working hours etc., the liaison officer will inform the nearest noise sensitive locations of the time and expected duration of the noisy works.

Monitoring
Where required, construction noise monitoring will be undertaken at periodic sample periods at the nearest noise sensitive locations to the development works to check compliance with the construction noise criterion.

Noise monitoring should be conducted in accordance with the International Standard ISO 1996: 2017: *Acoustics - Description, measurement and assessment of environmental noise.*

Project Programme
The phasing programme will be arranged so as to control the amount of disturbance in noise and vibration sensitive areas at times that are considered of greatest sensitivity. During excavation or when other high noise generating works are in progress on a site at the same time as other works of construction that themselves may generate significant noise and vibration, the working programme will be phased so as to prevent unacceptable disturbance at any time.

Construction Phase - Vibration

The vibration from construction activities will be limited to the values set out in Tables 8.2 and 8.3. Magnitudes of vibration slightly greater than those in the table are normally unlikely to cause cosmetic damage, but construction work creating such magnitudes should proceed with caution. Limit values have been provided for soundly constructed residential and commercial properties.

Operational Phase

Additional Traffic on Adjacent Roads
During the operational phase of the development, noise mitigation measures with respect to the outward impact of traffic from the development are not deemed necessary.

Mechanical Services Plant
Taking into account that sensitive receivers within the development are much closer than off-site sensitive receivers, once the relevant noise criteria is achieved within the development it is expected that there will be no negative impact at sensitive receivers off site, and therefore no further mitigation required.

8.8 PREDICTED IMPACTS

Construction Phase

During the construction phase of the project there is the potential for significant and moderate impacts on nearby noise sensitive properties due to noise emissions from site activities. The application of binding noise limits, hours of operation, along with implementation of appropriate noise and vibration control measures, will ensure that noise and vibration impact will have a negative, moderate and short-term impact on the surrounding environment.

Operational Phase

Additional Vehicular Traffic
The predicted change noise levels associated with additional traffic is predicted to be of imperceptible impact along the existing road network. In the context of the existing noise environment, the overall contribution of induced traffic is of neutral, imperceptible and long-term impact to nearby residential locations.

Mechanical Plant & Creche
Noise levels associated with operational plant are expected to be well within the adopted day and night-time noise limits at the nearest noise sensitive properties taking into account the site layout, the nature and type of units proposed and distances to nearest residences. Assuming the operational noise levels do not exceed the adopted design goals, the resultant residual noise impact from this source will be of neutral, Imperceptible, long term impact.

8.9 'DO-NOTHING' SCENARIO

Should the project not proceed there would be no increase in noise emanating from the site.

8.10 'WORST-CASE' SCENARIO

The 'worst case' scenario is that the development is not constructed as per the drawings and details provided in the planning application. While one would expect the development is required to be constructed in accordance with the planning documents which includes various mitigation measures outlined above.

Daytime Noise levels from the baseline noise survey range from 45 - 49dB L_{Aeq} and the night-time levels ranged from 39 - 45dB L_{Aeq} across the proposed development site. These figures are in the low risk area based on the ProPG guidelines. When the development becomes fully operational, due to people walking/running, dogs barking, children playing, mechanical plant, creche and addition vehicular traffic on surrounding roads noise will increase slightly

The 'worst case' scenario would be that the attributes, mitigation measures were not carried out, the ProPG Internal Noise Levels guidelines, BS 8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings are not met.

8.11 MONITORING AND REINSTATEMENT

Construction Phase

It is recommended that monthly noise and vibration monitoring surveys be carried along the boundary of the proposed site in order to monitor the effectiveness of noise and vibration management for the duration of the construction phase. Noise and vibration levels at Residential Sensitive Locations should not exceed the construction phase noise and vibration limit criteria in Table 8.1 and Table 8.2. Any breaches of these limits will require a review of operations and mitigation measures if the exceedance is due to the construction works on site.

In order to effectively manage noise and vibration at residential dwelling located approximately 13m east of the proposed site, installation of continuous data logging live noise and vibration monitoring system is required. This software will require remote login, data download and text/email alert functionality. It will measure key noise and vibration parameters (e.g. L_{Aeq}, L_{AFMAX}, L_{A90}, L_{A10}, PPV(mm/sec) and Frequencies as Hz.

Operational Phase

When the residential development is operational it will not result in an increase in noise and vibration levels at any of the sensitive locations beyond the site boundary therefore no monitoring is deemed necessary going forward.

8.12 DIFFICULTIES IN COMPILING INFORMATION

No difficulties were encountered during the preparation of the EIAR chapter.

8.13 REFERENCE

- BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites - Part 1 - Noise.
- BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites - Part 2 -Vibration.
- BS 6841 (1987): Measurement and evaluation of human exposure to whole-body mechanical vibration and repeated shock
- BS 4142: 2014: Methods for Rating and Assessing Industrial and Commercial Sound.
- Design Manual for Roads and Bridges, 2011
- EPA Advice Notes for Preparing Environmental Impact Statements, (Draft, September 2015);
- EPA Advice Notes on Current Practice (in the preparation of Environmental Impact Statements), (EPA, 2003);
- EPA Guidelines on the Information to be contained in Environmental Impact Statements, (EPA, 2002);
- EPA Guidelines on the Information to be contained in Environmental Impact Assessment Reports, (Draft August 2017)
- ISO 1996: 2017: Acoustics - Description, measurement and assessment of environmental noise.
- The Transport Infrastructure Ireland (TII, formerly NRA) Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes (TII, 2014), the Guidelines for the Treatment of Noise and Vibration in National Road Schemes (TII, 2004) was also considered in the preparation of the assessment. This document sets out noise and vibration limits for the construction phase which are generally applied by planning authorities to all construction projects.
- The Professional Guidance on Planning & Noise (ProPG), May 2017

9 CLIMATE & AIR QUALITY

9.1 INTRODUCTION

This section identified and assessed the potential air quality and climatic impacts associated with the proposed development both the construction and operational phases of the development.

It includes a comprehensive description of

- the existing air quality and climate at and in the vicinity of the subject site,
- how the construction and operational phases of the development may impact existing air quality and finally.
- the mitigation measures that shall be implemented to control and minimise the impact that the development may have on local ambient air quality and reduce the impact on the local micro climate.

Proposed Development Site Location and Brief Description
This is as described in chapters 1 (introduction) and 3 (Description of Development) of this EIAR and as set out in the statutory notices.

Statement of Competence
In accordance with Article 5(3)(a) of the EU Directive, by appointing Traynor Environmental, the applicant has ensured that this chapter has been prepared by "Competent experts".

9.2 METHODOLOGY

The general assessment methodology of the potential impact of the proposed development on air quality and climate has been devised in accordance with:

- 2017 EPA Guidelines on information to be contained in Environmental Impact Assessment Reports.
- Guidelines on Information to be Contained in an Environmental Impact Statement (EPA 2002).
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (DoHPLG, August 2018).
- Advice Notes on Current Practice (in preparation of Environmental Impact Statements) (EPA 2003).
- Environmental Protection Agency, 2015. Revised Guidelines on the Information to be Contained in Environmental Impact Statements.
- Environmental Protection Agency, 2015. Draft Advice Notes for Preparation of Environmental Impact Statements.
- Environmental Impact Assessment (EIA), Guidance for Consent Authorities Regarding Sub-Threshold Development (DoEHLG 2003).
- Development Management Guidelines (DoEHLG, 2007).
- European Union (Planning & Development) (Environmental Impact Assessment Regulations 2018).
- Design Manual for Roads and Bridges (DMRB).

Baseline Environment
The existing ambient air quality in the vicinity of the site has been characterised with information obtained from a number of sources including EPA Annual Air Quality in Ireland Reports and Local air monitoring stations data.
The ambient air quality data collected and reviewed for the purpose of this study focused on the principal substances (dust, vehicle exhaust emissions and boiler emissions) which may be released from the site during the construction and operation phases and which may exert an influence on local air quality.

Air Quality Standards and other Relevant Guidance
Air quality standards and guidelines are available from a number of sources. The guidelines and standards referenced in this report include those from Ireland and the European Union.

In order to reduce the risk to health from poor air quality, National and European statutory bodies have set limit values in ambient air for a range of air pollutants. These limit values or "Air Quality Standards" are health or environmental-based levels for which additional factors may be considered. For example, natural background levels, environmental conditions and socio-economic factors may all play a part in the limit value which is set (Ref Table 9.1). Air quality significance criteria are assessed on the basis of compliance with the appropriate standards or limit values.

The applicable standards in Ireland include the National Air Quality Standards Regulations 2011 (S.I No. 180 of 2011), which incorporate European Commission Directive 2008/50/EC which has set limit values for the pollutants SO_2, NO_2, PM_{10}, benzene and CO Council Directive 2008/50/EC combines the previous Air Quality Framework Directive (96/62/EC) and its subsequent daughter directives (including 1999/30/EC and 2000/69/EC). Provisions are also made for the inclusion of new ambient limit values relating to $PM_{2.5}$. The European 2008/50/EC Clean Air for Europe (CAFÉ) Directive is the current air quality directive for Europe which supersedes the European Directives 1999/30/EC and 2000/69/EC.

In order to assess a wider range of air pollutants in the development area it is necessary to review current air quality monitoring data from published sources such as the most recent EPA's 2018 Annual report entitled Air Quality in Ireland. This EPA report provides detailed monitoring data collected from a number of monitoring locations throughout Ireland on an annual basis to assess national compliance with National Air Quality Regulations. The location of the site at Clonattin, Gorey, Co. Wexford is characterised as a Zone D area as defined by the EPA.

EU legislation on air quality requires that Member States divide their territory into zones for the assessment and management of air quality. The zones currently in place in Ireland in are as follows:

- Zone A is the Dublin conurbation,
- Zone B is the Cork conurbation
- Zone C comprising 23 large towns in Ireland with a population >15,000.
- Zone D is the remaining area of Ireland.

The zones changed on 1 January 2013 to reflect the results of the 2011 census.

The air quality in each zone is assessed and classified with respect to upper and lower assessment thresholds based on measurements over the previous five years. Upper and lower assessment thresholds are prescribed in the legislation for each pollutant. The number of monitoring locations required is dependent on population size and whether ambient air quality concentrations exceed the upper assessment threshold, are between the upper and lower assessment thresholds, or are below the lower assessment threshold.

Design Manual for Roads and Bridges (DMRB) Guidelines.
The DMRB Model is based on the UK Highway Agency's DMRB and adapts it for use on national roads in Ireland through a series of implementation documents. Due to the lack of such a model in Ireland the UK DMRB was used to predict vehicle emissions from the new development.

DMRB Volume II, section 3, Part 1 Air Quality provides a screening model which is used to predict vehicle emissions for NO_2, NO_x, PM_{10}, carbon monoxide, benzene and 1,3-butadiene at sensitive receptors which have potential to be affected by the proposed development.

The DMRB model requires a number of inputs such as traffic flow (AADT), speed and vehicle mix and annual background pollutant concentrations. Background pollutant concentrations according to air zone were attained by averaging seven years of data, from yearly EPA air quality reports for 2013-2018. Predicted concentrations for the construction and operation phases of the project were compared with the Irish ambient air quality standard – S.I. No.180 of 2011 – Air Quality Standards Regulations 2011. These regulations set limit values and averaging periods, which are used to assess the impact of emissions on human health, vegetation and ecosystem.

Key pollutant concentrations were predicted for nearby sensitive receptors for the following scenarios:

- The baseline scenario (2020), for model verification;
- Do-Nothing scenario (DN), which assumes the retention of present site usage with no development in place (2023);
- Year Do-Something scenario (DS), which assumes the proposed development in place (2023);
- Design Year Do-Nothing scenario (DN), which assumes the retention of present site usage with no development in place (2038); and
- Design Year Do-Something scenario (DS), which assumes the proposed development in place (2038).

The assessment methodology involved using the DMRB Screening Model (Version 1.03c, July 2007), the NO_x to NO_2 Conversion Spreadsheet (Version 5.1, June 2016), and following guidance issued by the TII, and the EPA. The TII guidance states that the assessment must progress to detailed modelling if:

- Concentrations exceed 90% of the air quality limit values when assessed by the screening method; or
- Sensitive receptors exist within 50m of a complex road layout (e.g. grade separated junctions, hills etc).

The TII guidance, states that road links meeting one or more of the following criteria can be defined as being 'affected' by a proposed development and should be included in the local air quality assessment:

- Road alignment change of 5 metres or more;
- Daily traffic flow changes by 1,000 AADT or more;
- HGV flows change by 200 vehicles per day or more;
- Daily average speed changes by 10 km/h or more; or
- Peak hour speed changes by 20 km/h or more.

Concentrations of key pollutants are calculated at sensitive receptors that have the potential to be affected by the proposed development. For road links which are deemed to be affected by the proposed development and within 200 m of the chosen sensitive receptors inputs to the air dispersion model consist of: road layouts, receptor locations, annual average daily traffic movements (AADT), percentage heavy goods vehicles, annual average traffic speeds and background concentrations. The DMRB guidance states that road links at a distance of greater than 200 m from a sensitive receptor will not influence pollutant concentrations at the receptor. Using this input data, the model predicts the road traffic contribution to ambient ground level concentrations at the worst-case sensitive receptors using generic meteorological data. The DMRB model uses conservative emission factors, the formulae for which are outlined in the DMRB Volume 11 Section 3 Part 1 – HA 207/07 Annexes B3 and B4. These worst-case road contributions are then added to the existing background concentrations to give the worst-case predicted ambient concentrations. The worst-case ambient concentrations are then compared with the relevant ambient air quality standards to assess the compliance of the proposed development with these ambient air quality standards. The TII Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes detail a methodology for determining air quality impact significance criteria for road schemes and this can be applied to any project that causes a change in traffic flows. The degree of impact is determined based on both the absolute and relative impact of the proposed development.

The TII significance criteria have been adopted for the proposed development. The significance criteria are based on PM_{10} and NO_2 as these pollutants are most likely to exceed the annual mean limit values (40 µg/m^3). However, the criteria have also been applied to the predicted 8-hour CO, annual benzene and annual $PM_{2.5}$ concentrations for the purposes of this assessment.

Transport Infrastructure Ireland (TII) Guidelines

Construction Phase

As stated in the TII Guidance it is *"very difficult to accurately dust emissions arising from construction activities". "A semi quantitative approach is recommended to determine the likelihood of a significant impact, which should be combined with an assessment of the proposed mitigation measures".*

The semi-quantitative assessment outlined is used to assess the impact of the dust during the construction phase. TII guidance states that dust emissions from construction sites can lead to elevated PM_{10} concentrations and can cause soiling of properties. The impact of dust emissions during the construction phase is assessed by estimating the area over which there is a risk of significant impacts, in line with the TII guidance. Emissions from construction vehicles are assessed where construction traffic results in a significant (>10%) increase in AADT flows near sensitive receptors in accordance with the TII guidance.

Significance criteria outlined in Tables 9.10 and 9.11 are used to assess the impact of the construction traffic on worst-case sensitive for receptors.

Operational Phase

The TIFs Guidelines for the Treatment of Air Quality during the Planning and Construction of National Road Schemes specifies that the changes in pollutant concentrations alongside roads with a significant change in traffic should be assessed. It states that receptors should be considered at all road links where a greater than 5% change in flows or speeds is predicted for the "Do-Something" option.

Significance criteria have been adopted from the TII guidelines and these are presented in Appendix 9.2. The TII guidelines requires the consideration of NO_x and nitrogen deposition impacts at ecological sites that are located within 200m of the proposed development.

POLLUTANT	REGULATION	LIMIT CRITERIA	TOLERANCE	LIMIT VALUE
NITROGEN DIOXIDE	2008/50/EC	Hourly limit for the protection of human health – not to be exceeded more than 18 times/year	40% until 2003 reducing linearly to 0% by 2010	200 µg/m^3
		Annual limit for the protection of human health	40% until 2003 reducing linearly to 0% by 2010	40 µg/m^3
		Annual limit for the protection of vegetation	None	400 µg/m^3 NO & NO^2
LEAD	2008/50/EC	Annual limit for the protection of human health	100%	0.5 µg/m^3

SULPHUR DIOXIDE	2008/50/EC	Hourly limit for protection of human health – not to be exceeded more than 24 times/year Daily limit for protection of human health – not to be exceeded more than 3 times/year Annual and Winter limit for the protection of ecosystems	150 µg/m^3 NONE NONE	350 µg/m^3 125 µg/m^3 20 µg/m^3
PARTICULATE MATTER PM_{10}	2008/50/EC	24-hour limit for protection of human health – not to be exceeded more than 35 times/year Annual limit for the protection of human health	50% 20%	50 µg/m^3 40 µg/m^3
PARTICULATE MATTER $PM_{2.5}$ STAGE 1	2008/50/EC	Annual limit for the protection of human health	20% from June 2008. Decreasing linearly to 0% by 2015	25 µg/m^3
PARTICULATE MATTER $PM_{2.5}$ STAGE 2	2008/50/EC	Annual limit for the protection of human health	NONE	20 µg/m^3
BENZENE	2008/50/EC	Annual limit for the protection of human health	20% until 2006. Decreasing linearly to 0% by 2010	5 µg/m^3
CARBON MONOXIDE	2008/50/EC	8-hour limit (on a rolling basis) for protection of human health	60%	10 mg/m^3
DUST DEPOSITION	German TA Luft Air Quality Standard Note 1	30 Day Average	NONE	350 mg/m^2/day

Table 9-1 Air Quality Standards Regulations 2011 (based on EU Council Directive 2008/50/EC)

Note 1: Dust levels in urban atmospheres can be influenced by industrial activities and transport sources. There are currently no national or European Union air quality standards with which these levels of dust deposition can be compared. However, a figure of 350 mg/m^2-day (as measured using Bergerhoff type dust deposit gauges as per German Standard Method for determination of dust deposition rate, *VDI 2129*) is commonly applied to ensure that no nuisance effects will result from industrial or construction activities.

Construction Impact Assessment Criteria

Transport Infrastructure Ireland's 'Guidelines for the Treatment of Air Quality during the Planning and Construction of National Road Schemes' (Revision 1, 2011) states that

> "*it is very difficult to accurately quantify dust emissions arising from construction activities*" and that "*it is thus not possible to easily predict changes to dust soiling rates or PM_{10} concentrations.*"

The guidance advises the use of a semi-quantitative approach to determine the likelihood of a significant impact which should be combined with an assessment of the proposed mitigation measures.

The impact of construction related dust emissions is assessed by estimating the area over which there is a risk of significant impacts as per the NRA guidance. The construction assessment criteria, reproduced from the NRA guidance, are set out in Appendix 9.3 below.

Operational Impact Assessment Criteria

Once operational the proposed development may impact on air quality as a result of the requirements of new buildings to be heated and with the increased traffic movements associated with the development.

Air quality significance criteria are assessed on the basis of compliance with the national air quality limit values. The Air Quality Standards Regulations 2011 replace the Air Quality Standards Regulations 2002 (S.I. No. 271 of 2002), the Ozone in Ambient Air Regulations 2004 (S.I. No. 53 of 2004) and S.I. No. 33 of 1999.

Climate Assessment Methodology

Climate has implications for many aspects of the environment from soils to biodiversity and land use practices. The proposed development may impact on both the macro-climate and micro-climate. The macro-climate is the climate of a large geographic area such as Ireland. The micro-climate refers to the climate in the immediate area. With respect to microclimate, green areas are considered to be sensitive to development. Development of any green area is generally associated with a reduction in the abundance of vegetation including trees and a reduction in the amount of open, undeveloped space. The removal of vegetation or the development of man-made structures in these areas can intensify the temperature gradient.

To assess the impacts of converting vegetative surfaces to hard-standing with residential buildings and its significance, the amount of vegetative surfaces associated with the proposed development that will be converted to residential buildings and hard-standing has been considered.

The impact of the proposed scheme upon the macro-climate is assessed through the consideration of the change in CO_2 emissions that will occur due to the changes in traffic flow that occur in response to the proposed scheme. Ireland ratified the United Nations Framework Convention on Climate Change (UNFCCC) in April 1994 and the Kyoto Protocol in 1997 (FCCC 1997, 1999). For the purposes of the EU burden sharing agreement under Article 4 of the Kyoto Protocol, Ireland agreed to limit the net anthropogenic growth of the six GHGs under the Kyoto Protocol to 13% above the 1990 level over the period 2008 to 2012 (ERM 1998). The UNFCCC is continuing detailed negotiations in relation to GHGs reductions and in relation to technical issues such as Emission Trading and burden sharing. The most recent Conference of the Parties (COP24) to the agreement was convened in Katowice, Poland December 2018. COP24 was viewed as an important step towards the new 2015 agreement on climate change which was signed in Paris in late

2015. Contributions to greenhouse gas emissions will be based on Intended Nationally Determined Contributions (INDCs) which will form the foundation for climate action post 2020. Significant progress was also made on elevating adaption onto the same level as action to cut and curb emissions.

The EU, on the 23/24th of October 2014, agreed the "2030 Climate and Energy Policy Framework" (EU 2014). The European Council endorsed a binding EU target of at least a 40% domestic reduction in greenhouse gas emissions by 2030 compared to 1990. The target will be delivered collectively by the EU in the most cost-effective manner possible, with the reductions in the ETS and non-ETS sectors amounting to 43% and 30% by 2030 compared to 2005, respectively. Secondly, it was agreed that all Member States will participate in this effort, balancing considerations of fairness and solidarity. The policy also outlines, under "Renewables and Energy Efficiency", an EU binding target of at least 27% for the share of renewable energy consumed in the EU in 2030.

In 1999, Ireland signed the Gothenburg Protocol to the 1979 UN Convention on Long Range Transboundary Air Pollution. The initial objective of the Protocol was to control and reduce emissions of Sulphur Dioxide (SO_2), Nitrogen Oxides (NO_X), Volatile Organic Compounds (VOCs) and Ammonia (NH_3). To achieve the initial targets Ireland was obliged, by 2010, to meet national emission ceilings of 42 kt for SO_2 (67% below 2001 levels), 65 kt for NO_X (52% reduction), 55 kt for VOCs (37% reduction) and 116 kt for NH3 (6% reduction). In 2012, the Gothenburg Protocol was revised to include national emission reduction commitments for the main air pollutants to be achieved in 2020 and beyond and to include emission reduction commitments for $PM_{2.5}$. In relation to Ireland, 2020 emission targets are 25 kt for SO_2 (65% below 2005 levels), 65 kt for NO_X (49% reduction), 43 kt for VOCs (25% reduction), 108 kt for NH_3 (1% reduction) and 10 kt for $PM_{2.5}$ (18% reduction). COM (2013) 917 Final is the "Proposal for a Council Decision for the acceptance of the Amendment to the 1999 Protocol to the 1979 Convention on Long-Range Transboundary Air Pollution to Abate Acidification, Eutrophication and Ground level Ozone".

European Commission Directive 2001/81/EC, the National Emissions Ceiling Directive (NECD), prescribes the same emission limits as the 1999 Gothenburg Protocol. A National Programme for the progressive reduction of emissions of these four transboundary pollutants has been in place since April 2005 (DEHLG 2004, 2007). The most recent data available from the EU in 2010 indicated that Ireland complied with the emissions ceilings for SO_2, VOCs and NH_3 but failed to comply with the ceiling for NO_X (EEA 2011). COM (2013) 920 Final is the "Proposal for a Directive on the reduction of national emissions of certain atmospheric pollutants and amending Directive 2003/35/EC". The proposal will apply the 2010 NECD limits until 2020 and establish new national emission reduction commitments which will be applicable from 2020 and 2030 for SO_2, NO_X, NMVOC, NH_3, $PM_{2.5}$ and CH_4. In relation to Ireland, 2020-29 emission targets are for SO2 (65% below 2005 levels), for NO_X (49% reduction), for VOCs (25% reduction), for NH_3 (1% reduction) and for $PM_{2.5}$ (18% reduction). In relation to 2030, Ireland's emission targets are for SO_2 (83% below 2005 levels), for NO_X (75% reduction), for VOCs (32% reduction), for NH_3 (7% reduction), for $PM_{2.5}$ (35% reduction) and for CH_4 (7% reduction).

Guidance issued by the European Commission in 2013 entitled Guidance on Integrating Climate Change and Biodiversity into Strategic Environmental Assessment has been applied to this assessment in order to determine the potential impacts the proposed developments may have a climate change and biodiversity.

9.3 RECEIVING ENVIRONMENT

Description of the Baseline Environment/Context

The proposed strategic housing development at Clonattin, Gorey, Wexford will provide 363 no. residential units, a creche, a linear park, car and cycle parking, and a new access road to the east. All associated site development works and services provisions including bin storage areas, substations/switch rooms, plant areas, open spaces, boundary treatments, landscaping and all services required to facilitate the proposed development. A full description is provided in the statutory notices and in Chapter 3 of the EIAR.

The subject site is located in Clonattin, Gorey, Co. Wexford approximately 625m west of the M11 motorway. Bounded on the west by Hillcrest Drive Housing estate and the IDA Industrial Estate. The site is bounded on the east by agricultural fields and the M11 and to the north by Clonattin Road which lies on the development boundary. The Courtown road (R742) runs along the west and south of the development. The Mill lands residential area and a cinema is located south west and south east of the site boundary

The site is not located within a Conservation Area or an Architectural Conservation Area. The topography of the site is generally flat. The development area is located within a zone which includes a number of sources of transportation related air emissions principally, Wexford Bus routes 740 & NUM11, Bus Eireann X2, 133 & 133X and a number of local link routes which serve Gorey town. The site is also approx. 1km from Gorey Train station.

Meteorological Data

A key factor in assessing temporal and spatial variations in air quality is the prevailing meteorological conditions. Depending on wind speed and direction, individual receptors may experience very significant variations in pollutant levels under the same source strength (i.e. traffic levels). Wind is of key importance in dispersing air pollutants and for ground level sources, such as traffic emissions, pollutant concentrations are generally inversely related to wind speed. Thus, concentrations of pollutants derived from traffic sources will generally be greatest under very calm conditions and low wind speeds when the movement of air is restricted. In relation to PM_{10}, the situation is more complex due to the range of sources of this pollutant. Smaller particles (less than $PM_{2.5}$) from traffic sources will be dispersed more rapidly at higher wind speeds. However, fugitive emissions of coarse particles ($PM_{2.5}$ - PM_{10}) will increase at higher wind speeds. Thus, measured levels of PM_{10} will be a non-linear function of wind speed.

Description of Existing Climate

The nearest representative meteorological station to the subject site is at Johnstown which is located approximately 45km south of the site. Air temperature and rainfall for this location are representative of prevailing conditions experienced at the subject site.
The nearest representative synoptic meteorological station to the subject site is at Casement which is located approximately 70km north of the site. Long-term measurements of wind speed and direction for this location are representative of prevailing conditions experienced at the subject site. Recent meteorological data sets for Johnstown and Casement were obtained from Met Éireann for the purposes of this assessment study.

Rainfall

Precipitation data from the Johnstown meteorological station for the period 2017-2019 indicates a mean annual total of about 1056.80 mm.

Temperature

The annual mean temperature at Johnstown (2017-2019) is 10.40ºC. Given the relatively proximity of this meteorological station to the proposed development site, similar conditions would be observed. Table 9.2 sets out meteorological data for Johnstown from 2017-2019.

Year	Period	Rainfall (mm)	Mean Temperature (0C)
2017	**Annual Mean**	962.90	10.40
2018	**Annual Mean**	1147.20	10.40
2019	**Annual Mean**	1060.30	10.40
Mean		**1056.80**	**10.40**

Table 9-2 Meteorological Data for Casement 2011-2019

Wind

Wind is of key importance for both the generation and dispersal of air pollutants. Casement met data has been examined to identify the prevailing wind direction and average wind speeds over a five-year period (see Figure 9.1). For data collated during five representative years (2012 - 2016), the predominant wind direction is westerly to south-westerly with predominately moderate wind speeds.

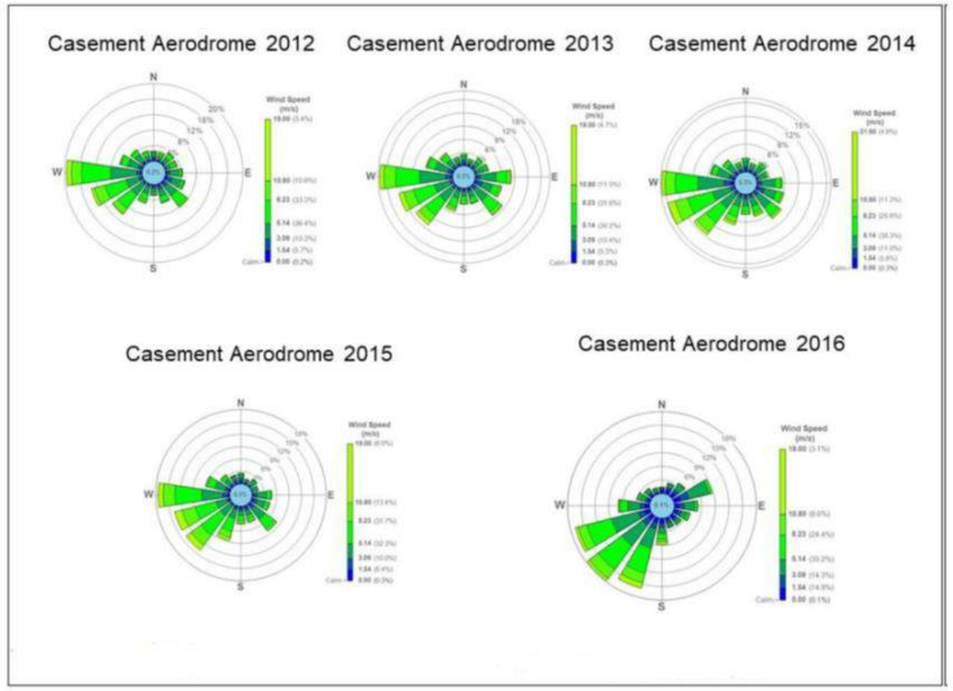

Figure 9-1 Casement Windrose 2012-2016

Description of Existing Air Quality

The existing ambient air quality at and in the vicinity of the site is typical of a urban location and as such, domestic and commercial heating sources and road traffic are identified as the dominant contributors of hydrocarbon, combustion gases and particulate emissions to ambient air quality.

Trends in Air Quality

Trends in Annual air quality monitoring programs have been undertaken in recent years by the EPA and Local Authorities. The most recent annual report on air quality "Air Quality in Ireland 2019– Key Indicators of Ambient Air Quality" details the range and scope of monitoring undertaken throughout Ireland with Gorey categorised as Zone D.

The most recent 2019 EPA publication includes a number of Zone D monitoring locations which would be broadly comparable to the expected air quality at the subject site. The various Zone D air quality monitoring stations within Ireland provide a comprehensive range of air quality monitoring data sets which have been selected as part of this assessment to describe the existing ambient air quality at the subject site.

Baseline Air Quality – Review of Available Background Data

Air quality monitoring programs have been undertaken in recent years by the EPA and Local Authorities. The most recent annual report on air quality in Ireland is "*Air Quality in Ireland 2019 – Indicators of Air Quality*" (EPA, 2020).

The EPA website details the range and scope of monitoring undertaken throughout Ireland and provides both monitoring data and the results of previous air quality assessments (EPA, 2020).

In terms of air monitoring and assessment, the proposed development site is within Zone D. The long-term monitoring data has been used to determine background concentrations for the key pollutants in the region of the proposed development. The background concentration accounts for all non-traffic derived emissions (e.g. natural sources, industry, home heating etc.) The most recent EPA publication includes a number of monitoring locations in Zone D which would be broadly comparable to the expected air quality at the subject site. The various air quality monitoring stations within the Zone D area provides a comprehensive range of air quality monitoring data sets which have been selected as part of this assessment to describe the existing ambient air quality at the subject site.

Nitrogen Dioxide (NO_2)

With regard to NO_2, continuous monitoring data from the EPA at the Zone D locations of Emo, Castlebar, Kilkitt, and Enniscorthy show that levels of NO_2 are below the annual limit values. The average results at all location has been used in the DMRB screening model. Long-term data for the period 2013 – 2019 show annual mean concentrations range from 2.0 – 13.0 µg/m^3; suggesting an average over the seven year period of no more than 5.72µg/m^3. Based on these results from 2013 - 2019 a current maximum daily 1-hr mean of 74.56µg/m^3 has been used in the DMRB screening model.

Air Quality Zone D		**Nitrogen Dioxide (NO_2)**						
Station	**Averaging Period**	**Year**						
		2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
Emo, Laois	Annual Mean NO_2 (µg/m^3)	4.0	3.0	3.0	4.1	3.4	3.0	4
	Max 1-hr NO_2 (µg/m^3)	38.0	30.0	34.0	48.7	33.0	91.0	56
Castlebar, Mayo	Annual Mean NO_2 (µg/m^3)	11.0	8.0	8.0	8.5	7.4	8.0	8
	Max 1-hr NO_2 (µg/m^3)	100.0	106.0	96.0	90.9	111.5	92.0	86
Kilkitt, Monaghan	Annual Mean NO_2 (µg/m^3)	4.0	3.0	2.0	3.0	2.3	3.0	5
	Max 1-hr NO_2 (µg/m^3)	72.0	38.0	97.0	80.2	25.4	37.0	59
Enniscorthy, Wexford	Annual Mean NO_2 (µg/m^3)	-	13.0	9.0	9.6	-	-	-
	Max 1-hr NO_2 (µg/m^3)	-	122.0	87.0	136.0	-	-	-

Table 9-3 Trends in Zone D Air Quality - Nitrogen Dioxide (NO_2)

Particulate Matter (PM_{10})

Results of Continuous PM_{10} monitoring carried out at the locations of Castlebar, Killkitt, Claremorris, Enniscorthy, Cobh, Roscommon Town and tipperary Town with seven years of annual mean concentrations are shown in Table 9.4. Long-term data for the period 2013 – 2019 show concentrations of the annual mean ranges from 7.8 – 15.0 µg/m^3; suggesting an average concentration over the seven year period of no more than 12.14 µg/m^3. The daily limit for the protection of human health is no more than 35 days>50µg/m^3. Based on the EPA data (Table 9.4) a conservative estimate of the current background PM_{10} concentration in the region of the proposed development is 12.14 µg/m^3.

Air Quality Zone D		**PM $_{10}$**						
Station	**Averaging Period**	**Year (PM_{10})**						
		2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
Castlebar, Mayo	Annual Mean PM_{10} (µg/m^3)	15.0	12.0	13.0	11.9	11.2	11.0	16
	Daily Max > 50 µg/m^3	70.0	67.0	57.0	57.0	97.1	38.0	53
Kilkitt, Monaghan	Annual Mean PM_{10} (µg/m^3)	11.0	9.0	9.0	8.1	7.8	9.0	7
	Daily Max > 50 µg/m^3	77.0	57.0	53.0	30.9	41.5	35.0	63
	Annual Mean PM_{10} (µg/m^3)	13.0	10.0	10.0	10.1	10.8	12.0	11

Claremorris, Mayo	Daily Max > 50 µg/m^3	69.0	33.0	32.0	35.4	51.7	43.0	44
Enniscorthy, Wexford	Annual Mean PM_{10} (µg/m^3)	-	22.0	18.0	17.3	-	-	18
	Daily Max > 50 µg/m^3	-	84.0	75.0	87.9	-	-	63
Cobh, Co. Cork	Annual Mean PM_{10} (µg/m^3)	-	-	-	-	-	15.0	13
	Daily Max > 50 µg/m^3	-	-	-	-	-	26.0	47
Roscommon Town	Annual Mean PM_{10} (µg/m^3)	-	-	-	-	-	12.0	12
	Daily Max > 50 µg/m^3	-	-	-	-	-	34.0	54
Tipperary Town	Annual Mean PM_{10} (µg/m^3)	-	-	-	-	-	-	9
	Daily Max > 50 µg/m^3	-	-	-	-	-	-	54

Table 9-4 Trends in Zone D Air Quality - PM_{10}

Nitrogen Oxide (NO_x)

With regard to NO_x, continuous monitoring data from the EPA at the Zone D locations of Emo, Castlebar, Kilkitt, and Enniscorthy. The average long-term concentrations range from 2.0 – 25.0 µg/m^3 for the period 2013 – 2019. Based on these results a conservative estimate of the current background NO_X concentration in the region of the proposed development is 8.2 µg/m^3.

Air Quality Zone D		**Nitrogen oxide (NO_x)**						
Station	**Averaging Period**	**Year (NO_x)**						
		2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
Emo, Laois	Annual Mean NO_x (µg/m^3)	5.0	5.0	3.0	5.5	4.0	5.0	4.8
	Hourly Max[1]	55.0	30.0	63.0	172.7	67.4	248.0	164.8
Castlebar, Mayo	Annual Mean NO_x (µg/m^3)	16.0	12.0	11.0	13.4	10.5	11.0	11.1
	Hourly Max[1]	595.0	410	254.0	479.8	418.9	613.0	307.1
Kilkitt, Monaghan	Annual Mean NO_x (µg/m^3)	5.0	3.0	2.0	3.7	2.6	4.0	7.9
	Hourly Max[1]	231.0	162.0	289.00	456.9	110.2	51.0	258.4
Enniscorthy, Wexford	Annual Mean NO_x (µg/m^3)	-	25.0	9.0	17.3	-	-	-
	Hourly Max[1]	-	53.0	391.0	884.4	-	-	-

Table 9-5 Trends in Zone D Air Quality - Nitrogen oxide (NO_x)

Note 1 NO_x is expressed as µg/m^3.
Note 2 NO_x annual mean limit value for the protection of Vegetation: 30 µg/m^3 (Limit only applies to rural stations in Zone D)

Particulate Matter ($PM_{2.5}$)

Continuous $PM_{2.5}$ monitoring was carried out by the EPA at the Zone D locations of Longford Town, Claremorris, Castlebar, Kilkitt, Enniscorthy, Cobh and Roscommon Town showed annual mean levels of 5.0 – 18.0 µg/m^3 over the period 2013 - 2019. Based on this EPA data shown in table 9.6, an average background $PM_{2.5}$ concentration in the region of the proposed development is 10.33 µg/m^3. There were no exceedances of limit of 25 µg/m^3 in annual mean.

Air Quality Zone D		**PM $_{2.5}$**						
Station	**Averaging Period**	**Year ($PM_{2.5}$)**						
		2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
Longford Town	Annual Mean PM_{10} (µg/m^3)	17.0	13.0	-	12.0	9.2	9.0	9.0
	Daily Max	78.0	43.0	-	56.6	82.0	54.0	56.0
Claremorris, Mayo	Annual Mean PM_{10} (µg/m^3)	8.0	5.0	10.0	6.0	5.6	6.0	4.0
	Daily Max	60.0	23.0	32.0	27.2	45.7	36.0	16.0
Castlebar, Mayo	Annual Mean PM_{10} (µg/m^3)	-	-	13.0	-	-	-	-
	Daily Max	-	-	57.0	-	-	-	-
	Annual Mean PM_{10} (µg/m^3)	-	-	9.0	-	-	-	-
Kilkitt, Monghan	Daily Max	-	-	53.0	-	-	-	-
Enniscorthy, Wexford	Annual Mean PM_{10} (µg/m^3)	-	-	18.0	-	-	13.0	14.0
	Daily Max	-	-	75.0	-	-	54.0	77.0
Cobh, Cork	Annual Mean PM_{10} (µg/m^3)	-	-	-	-	-	10.0	8.0
	Daily Max	-	-	-	-	-	18.0	40.0
Roscommon Town	Annual Mean PM_{10} (µg/m^3)	-	-	-	-	-	9.0	9.0
	Daily Max	-	-	-	-	-	30.0	47.0
Tipperary Town	Annual Mean PM_{10} (µg/m^3)	-	-	-	-	-	-	6.0
	Daily Max	-	-	-	-	-	-	51.0
Macroom	Annual Mean PM_{10} (µg/m^3)	-	-	-	-	-	-	15.0
	Daily Max	-	-	-	-	-	-	51.0

Table 9-6 Trends in Zone D Air Quality - ($PM_{2.5}$)

Note 1 $PM_{2.5}$ annual mean limit value for the protection of human health: 25 µg/m^3

Carbon Monoxide (CO)

With regard to CO, annual averages at the Zone D locations of Portlaoise and Enniscorthy over the 2014 – 2016 period are low, ranging from 0.4 to 0.6 µg/m^3 based on this EPA data, a conservative estimate of the current background CO concentration in the region of the proposed development is 0.50 mg/m^3. The maximum daily 8-hr mean of 3.48mg/m^3 has been used in the DMRB screening model.

Air Quality Zone D		**Carbon Monoxide(CO)**						
Station	**Averaging Period**	**Year (CO)**						
		2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
Portlaoise, Laoise	Annual Mean PM_{10} (mg/m^3)	-	0.4	-	-	-	-	-
	Max[1]	-	4.4	-	-	-	-	-
Enniscorthy, Wexford	Annual Mean PM_{10} (mg/m^3)	-	0.5	0.5	0.6	-	-	-
	Max[1]	-	2.4	3.0	4.1	-	-	-

Table 9-7 Trends in Zone D Air Quality - Carbon Monoxide (CO)

Note 1 maximum daily 8-hr mean limit value for protection of human health of 10 mg/m^3

Benzene

In terms of benzene, there is no reading in the Zone D monitoring area.

Background concentrations for 2023 and 2038 have been calculated. These have used the predicted current background concentrations and the year on year reduction factors provided by Transport Infrastructure Ireland in the Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes and the UK Department for Environment, Food and Rural Affairs LAQM.TG.

9.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed development as described in chapter 3 of this EIAR and set out in the statutory planning notices. When considering a development of this nature, the potential air quality and climate impact on the surroundings must be considered for each of two distinct stages:

A. - Construction phase;
B. - Operational phase.

During the construction stage the main source of air quality impacts will be as a result of fugitive dust emissions from site activities. Emissions from construction vehicles and machinery have the potential to impact climate. The primary sources of air and climatic emissions in the operational context are deemed long term and will involve the change in traffic flows or congestion in the local areas which are associated with the development.

The following describes the primary sources of potential air quality and climate impacts which have been assessed as part of this EIAR.

Do-Nothing Scenario
The Do-Nothing scenario includes retention of the current site without the proposed residential development in place. In this scenario, ambient air quality at the site will remain as per the baseline and will change in accordance with trends within the wider area (including influences from potential new developments in the surrounding area, changes in road traffic, etc).

9.5 POTENTIAL IMPACTS

Construction Impacts
Air Quality
The greatest potential impact on air quality during the construction phase of the proposed development is from construction dust emissions and the potential for nuisance dust and PM_{10}/$PM_{2.5}$ emissions. The proposed development can be considered moderate in scale and therefore there is the potential for significant dust soiling 50m from the source (Table 9.8). While construction dust tends to be deposited within 200m of a construction site, the majority of the deposition occurs within the first 50m. In order to minimise dust emissions during construction, a series of mitigation measures have been prepared in the form of a dust minimisation plan. Provided the dust minimisation measures outlined in the plan (see Appendix 9.3) are adhered to, the air quality impacts during the construction phase will not be significant. Regard has also been taken for the import of infill materials from off-site locations and potential dust impacts as a result of this will also be mitigated. The mitigation measures are summarised in Section 9.7

Source		Potential Distance for Significant Effects (Distance from Source)		
Scale	**Description**	**Soiling**	**PM_{10}**	**Vegetation Effects**
Major	Large construction sites, with high use of haul roads	100m	25m	25m
Moderate	Moderate sized construction sites, with moderate use of haul roads	50m	15m	15m
Minor	Minor construction sites, with limited use of haul roads	25m	10m	10m

Table 9-8 Assessment Criteria for the Impact of Dust from Construction, with Standard Mitigation in Place

Climate
There is the potential for a number of greenhouse gas emissions to atmosphere during the construction of the development. Construction vehicles, generators etc., may give rise to CO_2 and NO_2 emissions. However, the impact on the climate is considered to be imperceptible in the long and short term.

Human Health
Best practice mitigation measures are proposed for the construction phase of the proposed development which will focus on the pro-active control of dust and other air pollutants to minimise generation of emissions at source. The mitigation measures that will be put in place during construction of the proposed development will ensure that the impact of the development complies with all EU ambient air quality legislative limit values which are based on the protection of human health. Therefore, the impact of construction of the proposed development is likely to be short-term and imperceptible with respect to human health.

Operational Phase
Local Air Quality
There is the potential for a number of emissions to the atmosphere during the operational phase of the development. In particular, the traffic-related air emissions may generate quantities of air pollutants such as NO_2, CO, and PM_{10}.

Annual Average Daily Traffic Flow (AADT) information was obtained from Cronin & Sutton Consulting Group on this project and has been used to model pollutant levels under various traffic scenarios and under sufficient spatial resolution to assess whether any significant air quality impact on sensitive receptors may occur. Cumulative effects have been assessed, as recommended in the EU Directive on EIA (Council Directive 2014/52/EU). Firstly, background concentrations have been included in the modelling study. These background concentrations are year-specific and account for non-localised sources of the pollutants of concern. Appropriate background levels were selected based on the available monitoring data provided by the EPA.

The impact of the proposed development has been assessed by modelling emissions from the traffic generated as a result of the development. The impact of CO, NO_2, NO_x and PM_{10} for the years 2023 and 2038 was predicted at the nearby sensitive receptors to the development. This assessment allows the significance of the development, with respect to both relative and absolute impact, to be determined.

The receptors modelled represent the worst-case locations close to the proposed development and were chosen due to their close proximity (within 200 m) to the road links impacted by proposed development. The worst-case traffic data which satisfied the assessment criteria detailed in Section 9.2 is shown in Table 9.9 which has a 20% HGV flow. Six receptors have been identified in the vicinity of the proposed development. Sensitive receptors have been chosen as they have the potential to be adversely impacted by the development, these receptors are shown in Table 9.10 and Figure 9.2.

Link Number	Road Name	Speed (kph)	Base Year	Do-Nothing		Do-Something	
			2019	2023	2038	2023	2038
1	Clonattin Village	50	2440	2589	3162	4418	4990
2	Clonattin Road	50	5979	6581	7983	6649	8052
3	R742 (Courtown Road)	50	7086	7611	9273	6568	8230

Table 9-9 ADDT - Traffic Data used in Air Modelling Assessment

Name	Receptor Type	Coordinates	
		Eastings	Northings
R1	Residential Housing	316478	159948
R2	Residential Housing	316456	159848
R3	Residential Housing	316131	159398
R4	Industrial Unit	316186	159418
R5	Residential Housing	316150	159759
R6	Residential Housing	316175	159739

Table 9-10 Description of Sensitive Receptors

Figure 9-2 Approximate Sensitive Receptor Locations used in Modelling Assessment

Modelling Assessment

Transport Infrastructure Ireland Guidelines for the Treatment of Air Quality during the Planning and Construction of National Road Schemes detail a methodology for determining air quality impact significance criteria for road schemes and has been adopted for this assessment, as is best practice. The degree of impact is determined based on both the absolute and relative impact of the proposed development. Results are compared against the 'Do-Nothing' scenario, which assumes that the proposed development is not in place in future years, in order to determine the degree of impact.

NO_2

The results of the DMRB modelled impact of the proposed development for NO_2 in 2023 and 2038 are shown in Table 9.11 – 9.12. The annual average concentration is within the limit value at all worst-case receptors. Levels of NO_2 range between 14.98% - 21.48% in 2023 and 15.05% - 23.03% in 2038 of the annual limit value using the annual mean concentrations for the EPA. The hourly limit value for NO_2 is 200 µg/m^3 and is expressed as a 99.8th percentile (i.e. it must not be exceeded more than 18 times per year). The daily maximum 1-hour NO_2 concentration is not predicted to be exceeded in 2023 or 2038. There are some increases in traffic flows between 2023 and 2038, therefore any reduction in concentrations is due to reduced background concentrations and greater efficiencies predicted in engines.

The impact of the proposed development on annual mean NO_2 levels can be assessed relative to "Do Nothing (DN)" levels in 2023 and 2038. Relative to baseline levels, some imperceptible increases in pollutant levels are predicted as a result of the proposed development. With regard to impacts at individual receptors, the greatest impact on NO_2 concentrations will be an increase of 1.76% of the annual limit value at Receptor 2. Thus, using the assessment criteria outlined in Appendix 9.2 Tables A1 – A2, the impact of the proposed development in terms of NO_2 is negligible. Therefore, the overall impact of NO_2 concentrations as a result of the proposed development is long-term and imperceptible at all of the receptors assessed.

PM_{10}

The results of the modelled impact of the proposed development for PM_{10} in 2023 and 2038 are shown in Table 9.13. Predicted annual average concentrations at all receptors in the region of the development range between 30.48% - 31.88% in 2023 of the limit value. Future trends with the proposed development in place indicate similarly low levels of PM_{10}. PM_{10} concentrations in 2038 range between 30.50% - 32.28% of the limit value.

The impact of the proposed development can be assessed relative to "Do Nothing" levels in 2023 and 2038. Relative to baseline levels, some imperceptible increases in pollutant levels are predicted as a result of the proposed development. With regard to impacts at individual receptors, the greatest impact on PM_{10} concentrations will be an increase of 0.38% of the annual limit value at Receptors 2. Thus, the magnitude of the changes in air quality are negligible at all receptors based on the criteria outlined in Appendix 9.2, Tables A1 – A3. Therefore, the overall impact of PM_{10} concentrations as a result of the proposed development is long-term and imperceptible.

NO_x

The results of the modelled impact of the proposed development for NO_x in 2023 and 2038 are shown in Table 9.15. The annual average concentration is within the limit value at all worst-case receptors. Levels of NO_x range between 29.86% - 55.93% in 2023 and 30.16% - 62.90% in 2038 of the annual limit value using the annual mean concentrations for the EPA. With regard to impacts at individual receptors, the greatest impact on NO_x concentrations will be an increase of 6.46% of the annual limit value at Receptor 2.
The impact of the proposed development on annual mean NO_x levels can be assessed relative to "Do Nothing (DN)" levels in 2023 and 2038. Relative to baseline levels, some imperceptible increases in pollutant levels are predicted as a result of the proposed development. Thus, using the assessment criteria for NO_2 and PM_{10} outlined in Appendix 9.2 and applying these criteria to NO_x, the impact of the proposed development in terms of NO_x is negligible, long-term and imperceptible.

$PM_{2.5}$

The Air Quality Standards Regulations 2011 specify a $PM_{2.5}$ target value of 25 µg/m^3 over a calendar year to be met by 1 January 2015. Long term $PM_{2.5}$ monitoring was carried out in a number of Zone D locations. Based on this EPA data shown in table 9.6, an average background $PM_{2.5}$ concentration in the region of the proposed development is 10.16 µg/m^3. Therefore, long term averages were below the target value 25 µg/m^3.

CO

The results of the modelled impact of CO in the development for 2023 and 2038 are shown in Table 9.16. Predicted pollutant concentrations with the proposed development in place are below the ambient standards at all locations. Levels of CO range between 34.80% – 35.10% in 2023 and 34.80% -35.20 % in 2038 of the limit value. Future trends indicate similarly low levels of CO. Levels of CO are below their respective limit values, reaching 35.20% of the limit in 2040.

The impact of the proposed development can be assessed relative to "Do Nothing" levels in 2025 and 2040. CO concentration from the DMRB Model in both 2023 and 2038 are predicted to not increase. Thus, using the assessment criteria for NO_2 and PM_{10} outlined in Appendix 9.2 and applying these criteria to CO, the impact of the proposed development in terms of CO is negligible, long-term and imperceptible.

Recep	Impact Opening Year (2023)					Impact Design Year (2038)				
	DN	DS	DS-DN	Magnitude	Description	DN	DS	DS-DN	Magnitude	Description
1	5.87	5.99	0.12	Imperceptible	Negligible Increase	5.91	6.02	0.11	Imperceptible	Negligible Increase
2	6.78	7.49	0.71	Imperceptible	Negligible Increase	7.00	7.69	0.69	Imperceptible	Negligible Increase
3	7.91	7.93	0.02	Imperceptible	Negligible Increase	8.32	8.34	0.02	Imperceptible	Negligible Increase
4	8.03	8.05	0.02	Imperceptible	Negligible Increase	8.45	8.48	0.03	Imperceptible	Negligible Increase
5	8.42	8.08	-0.34	Imperceptible	Negligible Decrease	8.93	8.60	-0.33	Imperceptible	Negligible Decrease
6	9.00	8.59	-0.41	Small	Negligible Decrease	9.60	9.21	-0.39	Imperceptible	Negligible Decrease

Table 9-11 Annual Mean NO_2 Concentrations (µg/m^3)

Receptor	Daily Maximum 1-hour for NO_2 concentrations (µg/m^3)					
	Impact Opening Year (2023)			Impact Design Year (2038)		
	DN	DS	DS-DN	DN	DS	DS-DN
1	73.87	74.03	0.16	73.92	74.07	0.15
2	74.95	75.72	0.77	75.20	75.95	0.75
3	76.17	76.19	0.02	76.61	76.63	0.02
4	76.29	76.31	0.02	76.75	76.77	0.02
5	76.70	76.35	-0.35	77.24	76.91	-0.33
6	77.29	76.87	-0.42	77.29	76.87	-0.42

Table 9-12 Daily maximum 1-hour for NO_2 concentrations (µg/m^3)

Receptor	Impact Opening Year (2023)					Impact Design Year (2038)				
	DN	DS	DS-DN	Magnitude	Description	DN	DS	DS-DN	Magnitude	Description
1	12.17	12.19	0.02	Imperceptible	Negligible	12.18	12.20	0.02	Imperceptible	Negligible Increase
2	12.35	12.50	0.15	Imperceptible	Negligible Increase	12.40	12.55	0.15	Imperceptible	Negligible Increase
3	12.59	12.60	0.01	Imperceptible	Negligible Increase	12.69	12.70	0.01	Imperceptible	Negligible
4	12.62	12.63	0.01	Imperceptible	Negligible Increase	12.72	12.73	0.01	Imperceptible	Negligible
5	12.71	12.63	-0.08	Imperceptible	Negligible Decrease	12.84	12.76	-0.08	Imperceptible	Negligible Decrease
6	12.85	12.75	-0.10	Imperceptible	Negligible Decrease	13.00	12.91	-0.08	Imperceptible	Negligible Decrease

Table 9-13 Annual Mean PM_{10} Concentrations (µg/m^3)

Receptor	Impact Opening Year (2023)		Impact Design Year (2038)	
	DN	DS	DN	DS
1	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00

Table 9-14 Number of days with PM_{10} concentration > 50 µg/m^3

Receptor	Impact Opening Year (2023)					Impact Design Year (2038)				
	DN	DS	DS-DN	Magnitude	Description	DN	DS	DS-DN	Magnitude	Description
1	8.65	8.96	0.31	Imperceptible	Negligible Increase	8.74	9.05	0.31	Imperceptible	Negligible Increase
2	11.17	13.11	1.94	Small	Negligible Increase	11.80	13.72	1.92	Small	Negligible Increase
3	14.58	14.65	0.07	Imperceptible	Negligible Increase	15.89	15.95	0.06	Imperceptible	Negligible Increase
4	14.95	15.02	0.07	Imperceptible	Negligible Increase	16.33	16.40	0.07	Imperceptible	Negligible Increase
5	16.23	15.13	-1.10	Small	Negligible Decrease	17.91	16.82	-1.09	Small	Negligible Decrease
6	18.14	16.78	-1.36	Small	Negligible Decrease	20.22	18.87	-1.35	Small	Negligible Decrease

Table 9-15 Annual Mean NO_x Concentrations (µg/m^3)

Receptor	Impact Opening Year (2023)					Impact Design Year (2038)				
	DN	DS	DS-DN	Magnitude	Description	DN	DS	DS-DN	Magnitude	Description
1	3.48	3.48	0.00	Imperceptible	Negligible	3.48	3.48	0.00	Imperceptible	Negligible
2	3.49	3.50	0.00	Imperceptible	Negligible	3.49	3.50	0.01	Imperceptible	Negligible
3	3.50	3.50	0.00	Imperceptible	Negligible	3.51	3.51	0.00	Imperceptible	Negligible
4	3.50	3.50	0.00	Imperceptible	Negligible	3.51	3.51	0.00	Imperceptible	Negligible
5	3.51	3.50	-0.01	Imperceptible	Negligible	3.51	3.51	0.00	Imperceptible	Negligible Decrease
6	3.51	3.51	0.00	Imperceptible	Negligible	3.52	3.52	0.00	Imperceptible	Negligible

Table 9-16 Maximum 8-hour CO Concentrations (mg/m^3)

Year	Scenario	Roads	CO (kg/annum)	NOx (kg/annum)	PM_{10} (tonnes/annum)	C (tonnes/annum)
2023	Do Nothing	Clonattin Village	28	22	0	2
		Clonattin Road	801	622	13	71
		R742 (Courtown Road)	618	480	10	55
		Total	1447	1124	23	128
	Do Something	Clonattin Village	48	37	1	4
		Clonattin Road	809	628	13	72
		R742 (Courtown Road)	533	414	9	47
		Total	1390	1079	23	123
2038	Do Nothing	Clonattin Village	34	27	1	3
		Clonattin Road	972	754	16	86
		R742 (Courtown Road)	753	584	12	67
		Total	1759	1365	29	156
	Do Something	Clonattin Village	54	42	1	5
		Clonattin Road	980	761	16	87
		R742 (Courtown Road)	668	519	11	59

	Total	1702	1322	28	151
Increment in 2023	Clonattin Village	20 kg	15 Kg	1 Tonnes	2 Tonnes
	Clonattin Road	8 kg	6 Kg	0 Tonnes	1 Tonnes
	R742 (Courtown Road)	-85 kg	-66 Kg	-1 Tonnes	-8 Tonnes
	Total	-57kg	-45 Kg	0 Tonnes	-5 Tonnes
Increment in 2038	Clonattin Village	20 kg	15 Kg	0 Tonnes	2 Tonnes
	Clonattin Road	8 kg	7 Kg	0 Tonnes	1 Tonnes
	R742 (Courtown Road)	-85 kg	-65 kg	-1 Tonnes	-8 Tonnes
	Total	-57 kg	-43 Kg	-1 Tonnes	-5 Tonnes

Table 9-17 Regional Air Quality & Climate Assessment

Summary of Modelling Assessment

Levels of traffic-derived air pollutants for the development will not exceed the ambient air quality standards either with or without the proposed development in place. Using the assessment criteria outlined in Appendix 9.2, Table A1 – A3, the impact of the development in terms of PM_{10}, CO, NO_2, NO_x and benzene is negligible, long-term and imperceptible.

Regional Air Quality and Climate Impact

The regional impact of the proposed development on emissions of CO, NO_x, PM_{10} and C has been assessed using the procedures of Transport Infrastructure Ireland. The results (see Table 9.17) show that the likely impact of the proposed development has on the area with the increase and decrease traffic flow on the local roads. The likely overall magnitude of the changes on air quality and climate in the operational stage is imperceptible.

Human Health

Air dispersion modelling of operational traffic emissions was undertaken to assess the impact of the development with reference to EU ambient air quality standards which are based on the protection of human health. As demonstrated by the modelling results, emissions as a result of the proposed development are compliant with all National and EU ambient air quality limit values and, therefore, will not result in a significant impact on human health.

9.6 POTENTIAL CUMULATIVE IMPACTS

In accordance with The Planning and Development Regulations 2001 as amended, this section has considered the cumulative impact of the proposed development in conjunction with future and current development in the vicinity of the subject site. This section relates to the cumulative impact on the subject site itself and on surrounding sites.

The European Commission's report of May 1999 'Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions' defines cumulative impact as follows:

"Impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project".

The cumulative air quality impact of the existing residential development, under construction developments and existing local transport infrastructure together with the proposed development is assessed with regard to having established the baseline air quality and then predicting the impact that the proposed development will have on the baseline air quality. Together the combined impact can be assessed to determine if there is sufficient "atmospheric capacity" to facilitate the proposed development.

It is predicted that the cumulative impact of the construction and operational phases of the proposed development and proposed or permitted neighboring developments will not have an adverse long term impact on the receiving environment.

It is considered that there will be the potential for a short term slight negative cumulative impact associated with the construction phase of the subject development on ambient air quality and climate primarily as a result of the use of diesel to fuel construction plant and equipment. However, through the implementation of the mitigation measures and the integration into the design of the operational development of sustainable aspects and energy reduction features will ensure the receiving environment including off site residential receptors and existing habitats will not be adversely impacted.

9.7 MITIGATION MEASURES

Construction phase

Air Quality

The pro-active control of fugitive dust will ensure the prevention of significant emissions, rather than an inefficient attempt to control them once they have been released. The main contractor will be responsible for the coordination, implementation and ongoing monitoring of the dust management plan. The key aspects of controlling dust are listed below. Full details of the dust management plan can be found in Appendix 9.3.

- The specification and circulation of a dust management plan for the site and the identification of persons responsible for managing dust control and any potential issues;
- The development of a documented system for managing site practices with regard to dust control
- The development of a means by which the performance of the dust management plan can be monitored and assessed;
- The specification of effective measures to deal with any complaints received.

At all times, the procedures within the plan will be strictly monitored and assessed. In the event of dust nuisance occurring outside the site boundary, movements of materials likely to raise dust would be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations.

Climate

Construction traffic and embodied energy of construction materials are expected to be the dominant source of greenhouse gas emissions as a result of the construction phase of the development. Construction vehicles, generators etc., may give rise to some CO_2 and N_2O emissions. However, due to short-term and temporary nature of these works, the impact on climate will not be significant.

Nevertheless, some site-specific mitigation measures can be implemented during the construction phase of the proposed development to ensure emissions are reduced further. In particular the prevention of on-site or delivery vehicles from leaving engines idling, even over short periods. Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site.

Mitigation Measures (Construction)

- Avoid unnecessary vehicle movements and manoeuvring, and limit speeds on site so as to minimise the generation of airborne dust.
- Buildings shall be demolished by approved methods and in a manner that reduces the impact on air quality.
- Manual Stripping of buildings of internal fixings, metals, glass and asbestos.
- A 3m high solid wooden hoarding with a 3m high dust net shall be erected around the entire construction site perimeter giving a total dust barrier height of 6m.
- Use of rubble chutes and receptor skips during construction activities.
- All buildings in which asbestos has been identified shall be sealed during the asbestos removal process. Asbestos shall only be removed by an appropriately permitted company. All asbestos waste shall be double bagged, stored in a dedicated sealed waste container/skip prior to removal off-site

for disposal at an appropriately permitted/licenced facility. Records of all asbestos waste removed from site shall be maintained by the site manager and certificates of destruction shall be provided by the asbestos removal contractor. Asbestos surveys shall be conducted by an appropriately HSE approved contractor.

- During dry periods, dust emissions from heavily trafficked locations (on and off site) will be controlled by spraying surfaces with water and wetting agents.
- Hard surface roads will be swept to remove mud and aggregate materials from their surface while any unsurfaced roads will be restricted to essential site traffic only.
- A road sweeper vehicle shall be on-site at all times to clean soiled public roads in the vicinity of the site.
- A mobile wheel wash unit shall be installed at the site exit to wash down the wheels of all trucks exiting the site.
- An independent environmental consultant shall be appointed by the contractor to prepare a dust control and monitoring method statement prior to the commencement of site activities.
- A weekly inspection of each dust gauge will ensure that the site manager identifies at the earliest instance if dust suppression techniques shall be implemented at the project site areas.
- Re-suspension in the air of spillages material from trucks entering or leaving the site will be prevented by limiting the speed of vehicles within the site to 10kmh and by use of a mechanical road sweeper.
- The overloading of tipper trucks exiting the site shall not be permitted.
- Aggregates will be transported to and from the site in covered trucks.
- Where the likelihood of windblown fugitive dust emissions is high and during dry weather conditions, dusty site surfaces will be sprayed by a mobile tanker bowser.
- Wetting agents shall be utilised to provide a more effective surface wetting procedure.
- Exhaust emissions from vehicles operating within the construction site, including trucks, excavators, diesel generators or other plant equipment, will be controlled by the contractor by ensuring that emissions from vehicles are minimised by routine servicing of vehicles and plant, rather than just following breakdowns; the positioning of exhausts at a height to ensure adequate local dispersal of emissions, the avoidance of engines running unnecessarily and the use of low emission fuels.
- All plant not in operation shall be turned off and idling engines shall not be permitted for excessive periods.
- Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind. Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods.
- Material stockpiles containing fine or dusty elements including top soils shall be covered with tarpaulins.
- Where drilling or pavement cutting, grinding or similar types of stone finishing operations are taking place, measures to control dust emissions will be used to prevent unnecessary dust emissions by the erection of wind breaks or barriers. All concrete cutting equipment shall be fitted with a water dampening system.
- A programme of air quality monitoring shall be implemented at the site boundaries for the duration of construction phase activities to ensure that the air quality standards relating to dust deposition and PM_{10} are not exceeded. Where levels exceed specified air quality limit values, dust generating activities shall immediately cease and alternative working methods shall be implemented.
- A complaints log shall be maintained by the construction site manager and in the event of a complaint relating to dust nuisance, an investigation shall be initiated.

Table 9.18 presents a summary of dust control techniques which will be implemented at the site during activities.

SUMMARY OF DUST CONTROL TECHNIQUES	
Sources of Particular Matter	**Control Technique**
Loading and unloading processes	**Containment / Suppression**
	Reducing drop heights
	Use of variable height conveyors
	Use of chutes
Double handling transfer points	**Site and process design**
	Reduction of vehicle movements
Aggregate stockpiles	**Appropriate siting**
	Away from closest receptors/site boundaries
	Use of enclosures and bunding
	Reduced drop heights
	Water suppression
	Sprays
	Bowsers
	Covering
	Covered stock bins
	Dust covers
Mobile Crushing of site generated C&D Waste (if applicable)	**Appropriate siting**
	Away from closest receptors/site boundaries
	Use of enclosures and bunding
	Reduced drop heights
	Water suppression
	Sprays
	Bowsers
Conveyors / transfer points	**Containment**
	Wind boards
	Housings
	Suppression
	Water sprays
	Housekeeping
	Clean up of spilled materials
	Appropriate siting
	Away from closest receptors/site boundaries
Concrete Cutting Plant	**Suppression**
	Water sprays fitted to equipment/plant
Roadways including site yard area	**Suppression**
	Water sprays and bowsers
	Wheel wash at site compounds
Vehicles	**Washing / Covering**
	Wheel wash to be installed at site exit
	Vehicles exiting the site with C&D loads shall be covered with tarpaulin

Table 9-18 Summary of dust control techniques

Operational Phase
No additional mitigation measures are required as the operational phase of the proposed development as it is predicted to have an imperceptible impact on ambient air quality and climate.
The operational phase mitigation by design measures to minimise the impact of the development on air quality and climate are as follows:

Mitigation Measures (Operational)

- Thermally efficient glazing systems on all units
- Mechanical Ventilation and Heat Recovery (MVHR) systems or equivalent installed in all apartments
- Thermal insulation of walls and roof voids of all units
- Natural Gas heating in all units
- Inclusion of electric car charging points to encourage electric vehicle ownership

9.8 PREDICTED IMPACTS

Construction Phase
Various elements associated with the construction phase of the proposed development have the potential to impact local ambient air quality, however the potential construction phase impacts shall be mitigated as detailed in Section 9.7 above to ensure there is a minimal impact on ambient air quality for the duration of all construction phase works.

Air Quality
When the dust minimisation measures detailed in the mitigation section of this Chapter (Section 9.7) are implemented, fugitive emissions of dust from the site will be insignificant and pose no nuisance at nearby receptors.

Climate
Impacts to climate during the construction phase are considered imperceptible and therefore residual impacts are not predicted.

Operational Phase
The results of the air dispersion modelling study indicate that the impacts of the proposed development on air quality and climate is predicted to be imperceptible with respect to the operational phase for the long and short term.
It is predicted that the operational phase of the development will not generate air emissions that would have an adverse impact on local ambient air quality or local human health.

9.9 'DO NOTHING' SCENARIO

The Do-Nothing scenario includes retention of the current site without the proposed residential development in place. In this scenario, ambient air quality at the site will remain as per the baseline and will change in accordance withtrends within the wider area (including influences from potential new developments in the surrounding area, changes in road traffic, etc).

9.10 WORST CASE SCENARIO

The main potential for adverse impact on local air quality will occur during the construction phase. The worst-case scenario therefore corresponds to the situation where the mitigation measures for construction activities fail or are not implemented. Should dust mitigation measures not be implemented during the construction phase, significant dust nuisance is likely in areas close to the construction site. Given the distance to sensitive receptors dust nuisance is not considered to be a significant issue providing mitigation measures are carried out.

9.11 MONITORING & REINSTATEMENT

Monitoring
Monitoring of construction dust deposition at nearby sensitive receptors (residential dwellings) during the construction phase of the proposed development is recommended to ensure mitigation measures are working satisfactorily. This can be carried out using the Bergerhoff method in accordance with the requirements of the German Standard VDI 2119. The Bergerhoff Gauge consists of a collecting vessel and a stand with a protecting gauge. The collecting vessel is secured to the stand with the opening of the collecting vessel located approximately 2m above ground level. The TA Luft limit value is 350 mg/(m2*day) during the monitoring period between 28 – 32 days.

There is no monitoring recommended for the operational phase of the development as impacts to air quality and climate are predicted to be imperceptible.

9.12 DIFFICULTIES IN COMPILING INFORMATION

There were no difficulties encountered in compiling this section of the EIAR.

9.13 REFERNCES

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- EU (2017) Ireland's Final Greenhouse Gas Emissions in 2015
- BRE (2003) Controlling Particles, Vapours & Noise Pollution From Construction Sites
- The Scottish Office (1996) Planning Advice Note PAN50 Annex B: Controlling The Environmental Effects Of Surface Mineral Workings Annex B: The Control of Dust at Surface Mineral Workings
- UK Office of Deputy Prime Minister (2002) Controlling the Environmental Effects of Recycled and Secondary Aggregates Production Good Practice Guidance
- USEPA (1997) Fugitive Dust Technical Information Document for the Best Available Control Measures
- USEPA (1986) Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition (periodically updated)

10 LANDSCAPE AND VISUAL ASSESSMENT

10.1INTRODUCTION

This chapter includes the Landscape and Visual Impact Assessment (LVIA) that was completed by McGill Planning Ltd to assess the potential impact and effect of the proposed development on the landscape setting as well as on visual receptors in the landscape such as residents, visitors, people pursuing recreational activities etc. The assessment indicates the types and levels of the anticipated effects of the development.

Photomontages have been prepared for the proposed scheme by Visual Lab (refer to the proposed views for photomontages outlined in section 10.8 below (A3 of the photomontages also included with the SHD application pack).

Definition of Landscape

The European Landscape Convention 2000 (ELC), also known as the Florence convention, defines landscape as 'an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors'. The ELC applies to natural, rural, urban and peri-urban areas and concerns landscapes that might be considered outstanding as well as every day or degraded. This is an inclusive definition that extends beyond the idea of landscape as only a matter of aesthetics and visual amenity.

The National Landscape Strategy for Ireland 2015-2025, which was developed as a result of the ELC, recognises that the Irish landscape has evolved over time and will continue to do so. This strategy notes that landscape is more than our stunning countryside and dramatic coastline; it also encompasses out towns, cities and villages, the ordinary and the everyday.

The Planning and Development Act 2000, as amended, provides that 'landscape' has the same meaning as in the ELC. The PDA, as amended, requires Development Plans and Regional Guidelines to include objectives relating to landscape, in accordance with relevant policies or objectives for the time being of the Government or any Minister of the Government relating to providing a framework for identification, assessment, protection, management and planning of landscapes and developed having regard to the European Landscape Convention done at Florence on 20 October 2000. In addition, an environmental impact assessment much assess the direct and indirect effects of a proposed development on the landscape.

10.2METHODOLGY

This assessment has been prepared based on the following guidelines and documents:

- Guidelines on the Information to be contained in and Environmental Impact Statement, by the Environmental Protection Agency, 2002
- Revised Guidelines on the information to be contained in Environmental Impact Statements- Draft, by the Environmental Protection Agency, 2015
- Advice Notes on Current Practice in the preparation of Environmental Impact Statements, by the Environmental Protection Agency, 2015.
- Guidelines on Environmental Impact Assessment, Draft, by the Environmental Protection Agency, 2017.
- Guidelines for Landscape and Visual Assessment, 3rd Ed., Landscape Institute and Institute of Environmental Management and Assessment, 2013.
- National Landscape Strategy for Ireland, Department of Arts, Heritage and the Gaeltacht, 2015-25

The Landscape and Visual Assessment involved:

- Visiting the area;
- Undertaking a desk study of the subject site and its immediate environs in relation to its local and urban significance using the information gathered from site visits, studying aerial photography and Ordnance Survey mapping;
- Establishing and describing the receiving environment in terms of the existing landscape and its visual amenity;
- Assessing the nature, scale and quality of the proposed development through examination of the design team's drawings, illustrations and descriptions of the proposed scheme;

The EPA Guidelines recommend using descriptive terminology to determine the types, quality and significance of effects. This guidance is also included in the GLVA which recommends using categories of significance to describe effects.

Once the receiving environment has been established, the proposed development is then applied to allow the identification of potential positive, negative and neutral effects, prediction of their magnitude and the assessment of their significance on the environment. The definition of these effects is defined are given in Table 10.1. The magnitude of these effects is categorised as 'slight', 'moderate', 'substantial' or 'no perceived change' and the criteria for each category is given in Table 10.2. Mitigation measures can then be identified, usually forming the main elements of the landscape masterplan, to reduce as far as possible any potential negative environmental effects. The effects of the proposal are considered during both the construction and operational phase of the proposed development.

The tables below provide definitions for the descriptive terminology that will be used to assess the effect the proposed development is likely to have on the landscape.

Effect Type	Definition
Positive Effect	A change, which improves the quality of the existing landscape character.
Neutral Effect	A change, which does not affect the quality of the landscape character.
Negative Effect	A change, which reduces the quality of the existing landscape character.

Table 10-1 Effect Types

Category	Definition
Substantial Effect	Total loss or major alteration of key elements / features / characteristics of the baseline landscape character and / or introduction of features considered to be totally uncharacteristic when set within the receiving landscape and its level of sensitivity.
Moderate Effect	Partial loss or alteration of key elements / features / characteristics of the baseline landscape character and / or introduction of features that may be prominent but not necessarily considered to be substantially uncharacteristic when set within the receiving landscape and its level of sensitivity.
Slight Effect	Minor loss or alteration to one or more key elements / features / characteristics of the baseline landscape character and / or introduction of features that may not be uncharacteristic when set within the receiving landscape and its level of sensitivity.
No Perceived Change	Very minor loss or alteration to one or more key elements / features / characteristics / of the baseline landscapes approximating the no change situation.

Table 10-2 Effect Categories

10.3RECEIVING ENVIRONMENT

Context and Character

The subject site is located within Clonattin Upper, Gorey, Co. Wexford.

The subject site consists primarily of agricultural fields, including hedgerows and mixed vegetation. The north-western portion of the site has been partially cleared and contains a portion of an existing road. The north-eastern portion of the site is covered mixed vegetation and scrub. A large attenuation pond is located within the south-eastern corner of the site. Clonattin Stream marks the eastern and southern boundary of the site separating the site from the agricultural lands.

The site is bounded to the south and east by further agricultural lands, to the north and west by existing residential developments. The north of the site fronts onto Clonattin village road, which separates the subject site from the existing residential development.

There are two existing derelict buildings on site but these are not of any architectural or historical merit.

There are no protected structures or monuments on site or within the vicinity of the subject site. There site is also not located within an Architectural Conservation Area or a Conservation Area. The site is not within a Special Area of Conservation (SAC) of Special Protection Area (SPA).

Overall, this landscape has a low to moderate sensitivity with a carrying capacity for further residential development subject to quality design and layout.

Figure 10-1 Ariel view of subject site and surrounding area

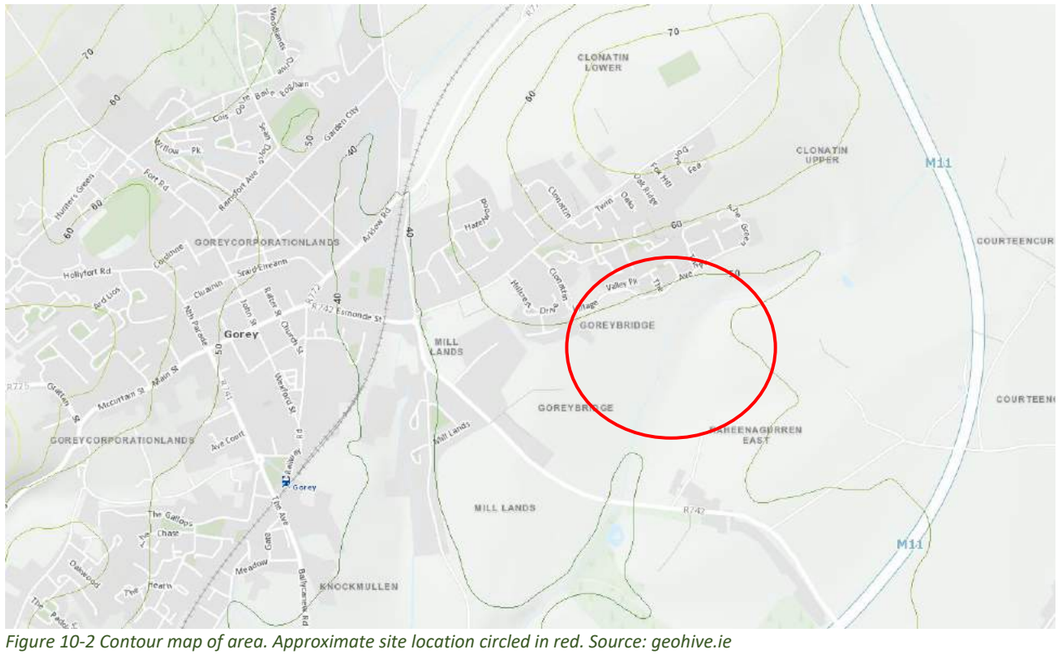

Figure 10-2 Contour map of area. Approximate site location circled in red. Source: geohive.ie

Visibility

The subject site will be most visible from Clonattin Village road and the adjacent residential development. The northern boundary of the site consists of timber post fencing allowing clear views into the subject site.

The boundaries to the south, east and west consist of hedgerows and treelines which limit the views into the site. In addition, the topography of the area limits the views of the site from the surrounding area.

Trees and Hedgerows

The subject site consists of moderate levels of scrub and vegetation. The south, east and west boundaries consist of hedgerows and treelines and further treelines and hedgerows are found throughout the site.

The Arboricultural Development Report and accompanying drawings, submitted with the planning application, outlines the existing trees and vegetation in further detail.

Planning Policy Context

Section 14.4.2 of the *Wexford County Development Plan 2013-2019* outlines the Landscape Character Assessment for the county. It divides the county into four landscape character units – coastal, lowlands, uplands, and river valley – and also identifies Landscapes of Greater Sensitivity. This character units are mapped in Map 13 of the Development Plan. An extract from this map is shown below in figure 10-3 which shows the subject site is located within a Lowland Character Unit. In relation to lowlands, the development plan notes:

> *'The Lowland area generally comprises gently undulating lands and relates to extensive areas of the county. This landscape has characteristics which provide it with a* ***higher capacity to absorb development without causing significant visual intrusion.*** *The landscape is characterised by higher population levels and more intensive agriculture. It is punctuated by many of the county's hills and ridges, the more sensitive of which have been defined as Landscapes of Greater Sensitivity.*' Emphasis added.

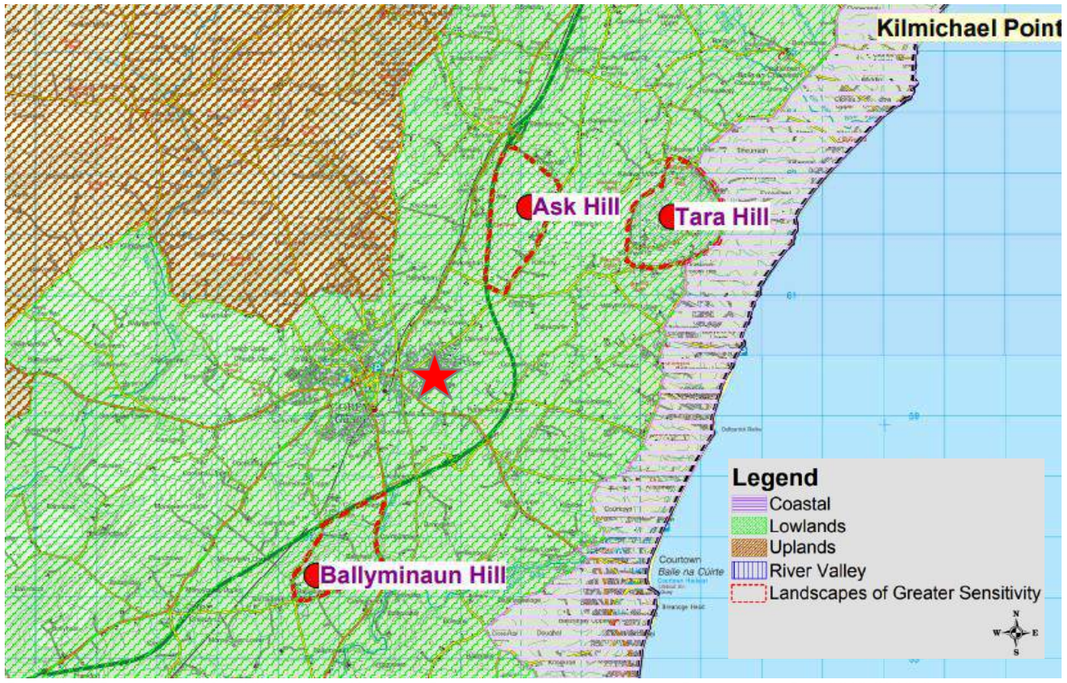

Figure 10-3 Extract from Map 13 Landscape Units and Features *in the Wexford County Development Plan 2013-2019. Site Location identified by red star.*

The Development Plan includes the following objectives in relation to landscape:

- Objective L01 To have regard to the Landscape Character Assessment and associated map contained in Volume 3, the Landscape and Landscape Assessment-Guidelines for Planning Authorities (2000) Draft and any updated versions of these guidelines published during the lifetime of the Plan, when assessing planning applications for development
- Objective L03 To ensure that developments are not unduly visually obtrusive in the landscape, in particular in the Upland, River Valley and Coastal landscape units and on or in the vicinity of Landscapes of Greater Sensitivity.
- Objective L04 To require all developments to be appropriate in scale and sited, designed and landscaped having regard to their setting in the landscape so as to ensure that any potential adverse visual impacts are minimised.
- Objectives L05 To prohibit developments which are likely to have significant adverse visual impacts, either individually or cumulatively, on the character of the Uplands, River Valley or Coastal landscape or a Landscape of Greater Sensitivity and where there is no overriding need for the development to be in that particular location.

The Gorey Town and Environs Local Area Plan 2017-2023 provides a landscape concept for the different areas within Gorey. An extra from the Landscape Concept plan (Figure 20 of the LAP) is shown in figure 10-4 below.

The LAP outlines the following key components in relation to the landscape component:

- To enhance the current role of the county roads as green routes, by retaining established landscape features and adding new pedestrian and cyclist features.
- To support the development of a Hub level recreational and amenity area to be known as 'Clonattin Park'.
- To provide a new connected green infrastructure of local corridors and hubs feeding into the river corridors that provide for improved quality and connectivity of biodiversity, amenity (including a neighbourhood park and play areas), local water management.
- Development of a new 'hub' par which will facilitate the needs of existing and new residents in the area as well as other users in the town and the development of the Clonattin Stream as a green infrastructure corridor and linear park.

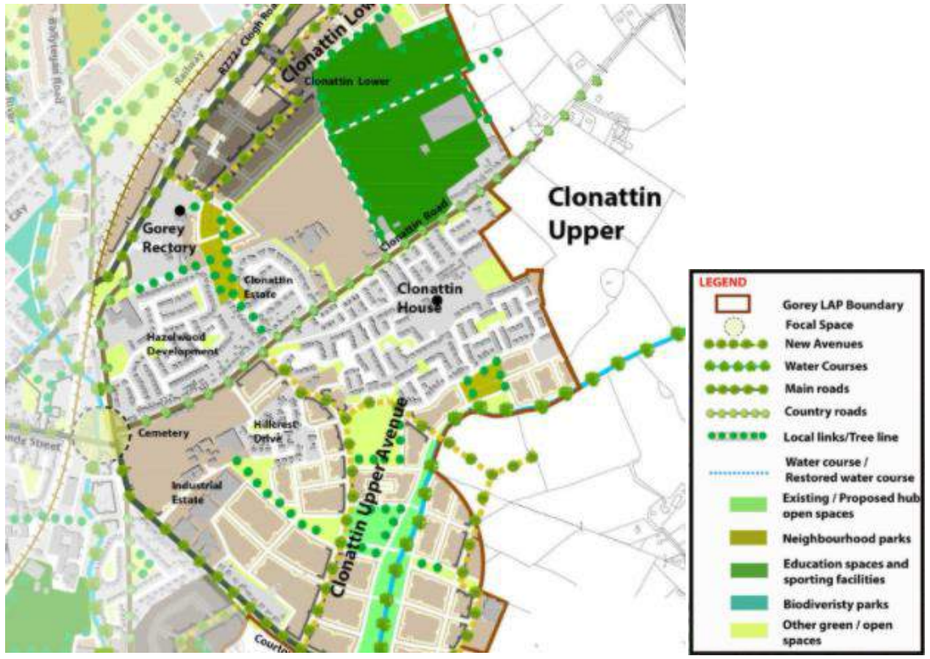

Figure 10-4 Extract from Landscape Concept Plan for Clonattin in Gorey Town and Environs Local Area Plan 2017-2023

10.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed strategic housing development at this site in Clonattin, Gorey will include the demolition of the existing buildings and will provide 363 no. residential units, a creche, public open space, a new access road and bridge connecting to Courtown Road. All associated site development works and services provisions including parking, bin storage, substations, landscaping and all services required to facilitate the proposed development. A full description is provided in the statutory notices and in Chapter 3 of the EIAR.

Landscaping

The proposed development includes a comprehensive landscaping plan. The scheme provides six high quality areas of public open space throughout the development site. The locations of these open spaces are consistent with the LAP Concept Plan for Clonattin.

The existing attenuation pond will be integrated into the public open space as part of the landscaping plan. The riparian buffer zone along Clonattin stream will provide space for a new amenity walkway along the site boundary while also protecting the local biodiversity.

Built Form and Layout

The proposed buildings range in height from 1-3 storeys and are laid out following the pattern of development set out in the Local Area Plan.

The proposed houses and apartments blocks have been designed to integrate with the existing architectural styles in the area, while also creating different character areas to aid legibility.

The proposed buildings along Clonattin Village Road front out onto the street which will create a more suburban character while provided a stronger sense of enclosure on the street.

10.5 POTENTIAL IMPACTS

Construction Phase

Any development on a large undeveloped site would naturally result in significant visual impact and material change to the landscape character of the site. The construction phase of the development would be visually unappealing during the initial stages and as the development progresses the visual impacts would be lessened.

Major impacts during the construction phase will be:

- Changes to the landscape due to construction works, land reprofiling, demolition, temporary structures, machinery and scaffolding on the site.
- Removal of some vegetation and hedgerows – in this case the majority of removal comprises existing grassland and some of the existing hedgerow along the southern boundary and a small number of trees.
- Dust and noise impacts to the surrounding areas.
- Large machinery and work vehicles going to and from the site.
- Construction workers coming and going from the site.

Mitigation measures to the construction phase will be dealt within the construction management plan.

Operational Phase

On completion the proposed development will significantly alter the immediate landscape from a agricultural field with two derelict buildings and an attenuation pond to a significant residential development comprising 363 no. residential units ranging in height from 2-3 storeys, and with a creche, associated routes, open space, landscaping and boundary treatments. The proposal also includes a new link road and a new bridge over the stream that will connect the site to Courtown Road.

While significant, this impact will have a positive impact on the character of the residential area to the north. The buildings fronting onto Clonattin Village Road will provide an increased sense of enclosure along the street. The development of the site will replace the current

10.6 POTENTIAL CUMULATIVE IMPACTS

The site and the surrounding area are not identified as a sensitive landscape in the Development Plan. In addition, the site is zoned for residential development, open space, and community and education. Therefore, the development of the subject site is considered to be in line with planning policy and is not expected to have a negative impact on the landscape character. The proposed development is in line with the zonings and will provide a scheme appropriate for the site's context.

The lands south of the site to Courtown Road are zoned for further development. Following the development of these lands, the character of the landscape will become slightly more suburban in character. This character change is to be expected and is in line with the local planning policy. The proposed development has been designed to integrate with any future development to the south.

The visual impact of the scheme will decrease in time with the maturation of the proposed landscaping and planting.

10.7MITIGATION MEASURES

Design Stage

As described in the Chapter 2 of this EIAR, alternative layouts and designs were considered before the deciding on the chosen layout. A key consideration in this design process was the impact of the proposed development on the surrounding landscape and how it would integrate into the area. The layout was designed to integrate with the existing residential development to the north while complementing the agricultural land to the south and east.

Consideration of the impact on landscape and visual aspects has been integral in the design and layout of the scheme. A number of mitigation measures have been addressed including:

- Reference to Gorey Town and Environs LAP Green Infrastructure Policies and Objectives for development sites with the inclusion of Sustainable Urban Drainage proposals integrated into the landscape.
- Provision of open spaces for future interaction of the said and adjoining developments
- The use of high quality hard and soft landscape materials befitting of a new residential scheme and suitable to the existing landscape
- Integrating the landscape elements of this extensive development into the surrounding built environment and connecting pathways and cycleways.
- Retention of existing trees on, and adjoining, the site and their landscape and screening value and integration into the landscape design with additional planting.

Construction Phase

To reduce the potential negative impacts during the construction phase, good site management and housekeeping practices will be adhered to. The visual impact of the site compounds and scaffolding visible during the construction phase are of a temporary nature only and therefore require no remedial action.

The areas set aside for open spaces will be fenced off with no compounds or storage of materials taking place in these areas, in accordance with an agreed Construction Management Plan. To ensure the successful retention of trees and hedgerows, an Arborist is recommended to be retained by the contractor or developer to monitor and advise any works within the Root Protection Zones of retained trees.

Operational Phase

Mitigation measures have been incorporated into the design to minimise visual intrusion and adverse landscape impact whilst integrating the development into the surrounding landscape character.

Tree and other planting are proposed throughout the site and particularly within the main open spaces. An extensive landscape programme is proposed to create the optimum landscape solution for this new residential development. The extensive landscaping proposal will help soften the visual impact of the development and with future maturing of planting will lead to a very attractive residential layout that can integrate well with the adjoining uses.

Existing boundary hedgerow and planting will be maintained and enhanced where possible to provide natural screening of the site as currently provided.

Streetscape design will incorporate planting and landscaping to reduce the visual impact of the buildings and to integrate the proposed buildings with the surrounding environment.

10.8 PREDICTED IMPACTS

Landscape

The proposed development will constitute a significant alteration to the existing landscape character of the site and its immediate context.

However, this level of change has been pre-empted in the underlying planning context for the site with the large site zoned for residential development in the Local Area Plan.

The proposed development will add to the suburban character to the area and will help integrate the site into the surrounding landscape by providing a new residential development located south of the recently developed housing estates north of Clonattin Village Road.

In light of the underlying planning objectives for the zoned lands, and the specific design employed, the predicted change on landscape character is expected to be Moderate-Neutral.

Visual

A series of 10 photomontages have been prepared to assess the visual amenity impact of the proposed development (including proposed landscaping) from a variety of locations in the wider landscape.

Figure 10-5 Locations of viewpoints

Locations of Viewpoints	
View 1a1	View from Courtown Road, looking north
View 1c1	View from Cinema site, looking north
View 2	View from Raheenagurren East road, looking west
View 3	View from Clonattin Village Road, looking south-west
View 4	View from Clonattin Road, looking south-east
View 5	View from Clonattin Village Road, looking south
View 6	View from Millands Road, looking north-east
View 7	View from Blackstick Lane, looking west
View 8	View from field to east of site, along proposed road route, looking east
View 9	View from field to south-west of site, looking east

Table 10-3 List of Viewpoints

View 1a1: View from Courtown Road, looking north

Figure 10-6 View 1a1 Existing and Proposed

Existing

This view from Courtown Road looks north towards the site. The foreground is relatively flat and is dominated by Courtown Road and the associated footpath. The middle ground comprises a flat agricultural field with a single house located to the west of the view. The edge of the road and the field boundaries are marked by natural hedgerows with a mix of vegetation. The landscape undulates in the distance with small hills marking the horizon. There are glimpses of further houses visible in the distance through the vegetation.

Construction Phase

The construction works will generally not be visible from this view.

Operational Phase

The proposed development will not be visible from this viewpoint.

Predicted Effect

No Perceived Change

View 1c1: View from Cinema Site, looking north

Figure 10-7 View 1c1 Existing and Proposed

Existing

This view is taken from the car park of the cinema site, located off Courtown Road. The foreground is dominated by the car park which is landscaped with individual trees and some planting. A metal green fence marks the boundary of the car park with the adjacent agricultural fields. The adjacent fields are visible in the background and are divided by hedgerows and mixed vegetation. The land rises slightly in the distance making the hedgerows and fields more visible.

Construction Phase

The construction phase of the proposed access road will be clearly visible from this viewpoint, which will have a negative but temporary visual impact on the landscape. This landscape may be negatively impacted by construction noise, but this again will be temporary.

The construction phase of the residential units will not be visible from this viewpoint.

Operational Phase

The proposed access road will connect to this car park and will be clearly visible in this landscape. The green metal fence and a small number of trees will be removed to provide access for the road, which will open up the view of the surrounding landscape. The existing trees and planting within the car park will be removed to all a slight reconfiguration of the car park to connect with the access road.

Predicted Effect

Moderate- Neutral

View 2: View from Raheenagurren East road, looking west

Figure 10-8 View 2 Existing and Proposed

Existing

This view looks west along the Raheengurren East Road, with the subject site located in the distance. The road extends out into the distance, dipping below the M11 overpass. Beyond this overpass the landscape extends out to the horizon.

The road is bounded by grassy areas and hedges on both sides. The surrounding landscape is primarily rural in character with a significant vegetation and tree cover.

An entrance into a single house is located to the left.

Construction Phase

The construction phase of development is unlikely to be visible from this view.

Operational Phase

The proposed development will not be visible from this view.

Predicted Effect

No Perceived Change

View 3: View from Clonattin Village Road, looking south-west

Figure 10-9 View 3 Existing and Proposed

Existing

The view looks west along Clonattin Village Road with the subject site located to the left. This is the most elevated viewpoint and the landscape- south of Gorey extends out beyond this point. The character of this area is suburban in nature with an existing residential development located to the right. A timber fence marks the boundary between Clonattin Village Road and the subject site. Beyond this fence an agricultural landscape extends out with mixed vegetation, scrub and trees. A manicured and landscaped area is located in the foreground, to the left of the road. This landscaping adds to the suburban character of this area.

Construction Phase

The construction works will be visible from this viewpoint and will have a negative but temporary impact on the landscape.

Operational Phase

The proposed houses along Clonattin Village Road will be clearly visible from this viewpoint and will add to the character in this landscape. The proposed houses will front onto Clonattin Village Road, adding to the sense of enclosure, improving streetscape and sense of place. The materials and colours proposed will complement the existing development while also providing more interest and avoiding a monotonous development.

The rest of the development will be partially visible in the distance.

Whilst the level of change is significant it has been anticipated given the wider suburban context and the zoning of the lands for significant residential development.

Predicted Effect

Moderate-Positive

View 4: View from Clonattin Road, looking south-east

Figure 10-10 View 4 Existing and Proposed

Existing

This view is taken from Clonattin Road, looking south down Clonattin Village Road towards the subject site. The foreground is dominated by the intersection of Clonattin Road and Clonattin Village which sits centrally in the view. Clonattin Village Road slopes slightly upwards from Clonattin Road and turns to left in the background. Clonattin Road appears to slope slightly down to the right.

Both sides of Clonattin Village Road are lined with manicured planting and trees. There is a footpath along both sides of Clonattin Village Road which connect to footpaths along Clonattin Road.

Metal fencing to the right, along Clonattin Road, provide a restricted view into a construction site.

Construction Phase

The construction works will likely be visible from this location and will have a negative but temporary impact.

Operational Phase

The proposed development will be slightly visible from this viewpoint. Glimpses of the proposed houses will be visible through the existing trees.

Predicted Effect

Slight – Neutral

View 5: View from Clonattin Village Road, looking south

Figure 10-11 View 5 Existing and Proposed

Existing

This viewpoint is from Clonattin Village Road and looks south into the subject site. Clonattin Village Road cuts across this view. The foreground consists of manicured and managed grassy areas and footpaths. A streetlight along Clonattin Village Road points to a suburban landscape character. A timber post fence provides the boundary between Clonattin Village Road and the subject site. From this viewpoint the subject site consists of scrub, individual trees, hedgerows and vegetation.

There is a significant character difference between the subject site and the area north of the site. The subject site has a rural and agricultural character while Clonattin Village Road and the adjacent developments are more suburban in character.

Construction Phase

The construction phase of development will be clearly visible from this viewpoint. The construction phase will have a negative but temporary visual impact.

Operational Phase

The proposed development will be clearly visible from this viewpoint. The proposed central open space and the areas set aside for the school will dominate this view. The school is not included as part of this application and is only an indicative use, therefore, for the purposes of this photomontage, the area for the school has been shown as landscaped.

The proposed houses and landscaping visible from this view will add to the suburban character set by the existing developments. The colours and material used in the proposed houses has been carefully chosen to integrate with the existing residential areas.

Predicted Effect

Moderate – Positive

View 6: View from Millands Road, looking north-east

Figure 10-12 View 6 Existing and Proposed

Existing

This viewpoint from Millands Road looks north-east towards the subject site. The foreground is dominated by the road, which extends into the middle-distance to the right. A concrete pillar fence, which is slightly overgrown with grass provides the boundary between the road and the adjacent agricultural filed. This field extends out from the road to the agricultural buildings located in the distance. The further boundary of the field appears to consist of mature trees, a possible shelter belt. Further agricultural buildings are visible beyond these mature trees.

Construction Phase

The construction works are unlikely to be visible from this viewpoint.

Operational Phase

The proposed development will not be visible from this viewpoint.

Predicted Effect

No Perceived Change

View 7: View from Blackstick Lane, looking west

Figure 10-13 View 7 Existing and Proposed

Existing

This viewpoint looks west towards the subject site from the adjacent fields. This view is dominated by an agricultural field. The boundaries of this field consists of hedgerows. The land is slightly undulating with the field sloping down in the foreground before sloping back up in the distance. Some buildings are visible within the trees and vegetation in the distance, but they are not dominant features in the landscape.

The character of the landscape from this location is primarily rural and agricultural.

Construction Phase

The construction works may be slightly visible in the distance from this viewpoint.

Operational Phase

The proposed development will not be discernible in the distance given the existing landscaping and hedgerows.

Predicted Effect

No Perceived Change

View 8: View from field to east of site, along proposed road route, looking east

Figure 10-14 View 8 Existing and Proposed

Existing

This viewpoint looks east towards the subject site from the adjacent field. The character of the landscape from this location is primarily rural and agricultural with a patchwork field pattern divided by hedgerows. The land is slightly sloping down towards the left. Some buildings are visible within the trees and vegetation in the distance, but they are not dominant features in the landscape.

Construction Phase

The construction works will be clearly visible from this viewpoint. The construction phase will have a negative but temporary visual impact.

Operational Phase

The proposed development will be clearly visible from this viewpoint. The foreground of this view will be dominated by the proposed new access road, which will include a cycle track and footpath on both sides of the road. This new road leads up to the main area of the subject site where the proposed houses and apartment blocks will be clearly visible

Overall, the landscape character will be changed from rural to residential. This change, while significant, has been anticipated in the local area plan and the zoning for the site. The main area of the site is zoned for residential development, which the proposed development will provide, and the proposed road is a requirement of the local area plan.

Predicted Effect

Significant – Positive

View 9: View from field to south west of site, looking east

Figure 10-15 View 9 Existing and Proposed

Existing
This viewpoint looks east towards the subject site. The foreground consists of a maintained grassy area to the right. A residential street to the left stretches out from the foreground to the distance.

Construction Phase
The construction works may be slightly visible in the distance from this viewpoint.

Operational Phase
The proposed development will be slightly visible behind the house at the end of the street. Glimpses of the development may also be visible through the trees to the right of this viewpoint.

Predicted Effect
Slight – Neutral Effect

10.9 CONCLUSION

	Location of Viewpoints	Predicted Impact (Operational Phase)
View 1a1	View from Courtown Road, looking north	No Perceived Change
View 1c1	View from Cinema site, looking north	Moderate-Neutral
View 2	View from Raheenagurren East road, looking west	No Perceived Change
View 3	View from Clonattin Village Road, looking south-west	Moderate – Positive
View 4	View from Clonattin Road, looking south-east	Slight-Neutral
View 5	View from Clonattin Village Road, looking south	Moderate-Positive
View 6	View from Millands Road, looking north-east	No Perceived Change
View 7	View from Blackstick Lane, looking west	No Perceived Change
View 8	View from field to east of site, along proposed road route, looking east	Significant-Positive
View 9	View from field to south west of site, looking east	Slight-Neutral

Table 10-4 Summary of Visual Impacts

10.10 MONITORING

The post development monitoring of the landscape and visual effects on the environment will take the form of management of the proposed landscaping and open spaces within the development and which will be detailed more specifically in the bills of quantities and specification for the landscape contractor at the implementation stage of the landscape proposal.

10.11 REFERENCES

- *Advice Notes on Current Practice in the preparation of Environmental Impact Statements*, by the Environmental Protection Agency, 2015.
- *European Landscape Convention*, Florence, 2000
- *Guidelines for Landscape and Visual Assessment*, 3rd Ed., Landscape Institute and Institute of Environmental Management and Assessment, 2013.
- *Guidelines on Environmental Impact Assessment*, Draft, by the Environmental Protection Agency, 2017
- *Guidelines on the Information to be contained in and Environmental Impact Statement*, by the Environmental Protection Agency, 2002
- *National Landscape Strategy for Ireland*, Department of Arts, Heritage and the Gaeltacht, 2015-25
- *Revised Guidelines on the information to be contained in Environmental Impact Statements- Draft*, by the Environmental Protection Agency, 2015

11 TRAFFIC AND TRANSPORTATION

11.1 INTRODUCTION

This chapter of the EIAR has been completed by CS Consulting Engineers and assesses any likely or significant impacts associated with traffic and transportation issues arising from the proposed development, in respect of both the operational and construction stages. Relevant mitigation measures are also presented in this chapter.

This assessment is based principally on the outcome of the Traffic Impact Assessment (TIA) prepared by CS Consulting and submitted separately in support of this planning application. Reference should be made to the TIA for full details of the traffic impact assessment methodology and other transport-related aspects of the proposed development, particularly those that have no bearing on environmental impact.

11.2 METHODOLOGY

The methodology adopted for the assessment of traffic impact is summarised as follows:

1) A vehicular traffic count survey was undertaken at 5no. sites on the surrounding street network, to establish background traffic flows and existing peak hours.
2) A development trip generation assessment was carried out using survey-derived trip rates and TRICS data, to determine the potential vehicular trips to and from the proposed development site during peak hours. The vehicular trip generation of other nearby permitted developments was also assessed.
3) An appropriate distribution across the surrounding street network was assigned to vehicular trips generated by the subject development and by other permitted developments, based upon existing traffic characteristics. Allowance was also made for the redistribution of existing traffic via the new link road proposed as part of the subject development.
4) A spreadsheet model was created containing baseline year do-nothing traffic flow data. These traffic data were used to develop TRANSYT and PICADY models of 2no. surveyed junctions, as well as a PICADY model of the junction at which the proposed link road shall connect to the existing road network.
5) Future year traffic forecasts were derived from TII growth factors and development trip generation figures. These traffic flows were applied to the TRANSYT and PICADY junction models. The performance of these junctions was assessed for the baseline year of 2020 and the design year of 2038 (15 years after opening).

Background Peak Hour Identification

A 12-hour classified vehicular traffic count survey was undertaken on Tuesday the 19th of November 2019 by Traffinomics Limited, on behalf of CS Consulting. This survey was conducted between 07:00 and 19:00 at 5no. sites on Clonattin Road, Courtown Road, and Coach Road. The surveyed traffic flows were then scaled up using TII growth factors to obtain background traffic flows for the baseline year of 2020.

The weekday peak hour background traffic flows across all survey sites were found to occur between 08:15 and 09:15 (AM peak hour) and between 16:00 and 17:00 (PM peak hour).

Vehicular Trip Generation of Subject Development

The proposed development comprises a total of 363no. residential units, as well as a crèche facility with 83no. childcare spaces.

The vehicular trip generation of the development's residential units has been determined with reference to the existing Clonattin Village residential development, which is adjacent to the subject proposed development and comprises a similar mix of dwelling types. Location-specific residential trip rates were derived through the division of the surveyed arrival and departure trip numbers by the number of existing residential units in Clonattin Village.

Peak Hour	Arrivals per residential unit	Departures per residential unit
AM Peak (08:15-09:15)	0.203	0.426
PM Peak (16:00-17:00)	0.326	0.249

Table 11-1 Survey-derived Residential Trip Generation Rates

For the crèche within the subject development, vehicular trip generation has been calculated with reference to trip rates drawn from the industry-standard TRICS database under the sub-category '04 Education / D – Nursery'. These trip rates have been restricted insofar as possible to similar suburban locations and further refined with reference to 2016 CSO census data on the basis of:

- the population within 1 mile of the development site (8,000 approx.);
- the population within 5 miles of the development site (21,000 approx.);
- the aggregate mean car ownership rate within 5 miles of the development site (1.4 cars per household).

Peak Hour	Arrivals per pupil	Departures per pupil
AM Peak (08:15-09:15)	0.229	0.171
PM Peak (16:00-17:00)	0.084	0.072

Table 11-2 TRICS Crèche Trip Generation Rates

Vehicular trip numbers were calculated as a function of the trip rates given above, the total number of residential units within the proposed development, and the number of pupils to be accommodated by the proposed crèche. The following trip generation figures were calculated for the development as a whole:

Peak Hour	Arrivals	Departures	Total Trips
RESIDENTIAL UNITS			
AM Peak (08:15-09:15)	75	155	230
PM Peak (16:00-17:00)	118	90	208
CRECHE			
AM Peak (08:15-09:15)	19	14	33
PM Peak (16:00-17:00)	7	6	13
ENTIRE DEVELOPMENT			
AM Peak (08:15-09:15)	94	169	263
PM Peak (16:00-17:00)	125	96	221

Table 11-3 Subject Development Trip Generation

Vehicular Trip Generation of Nearby Permitted and Planned Developments

Vehicular trips predicted to be generated by 2no. permitted developments in the vicinity of the subject site, which were not operational at the time of the traffic survey, were also included in the background traffic flows for future assessment years.

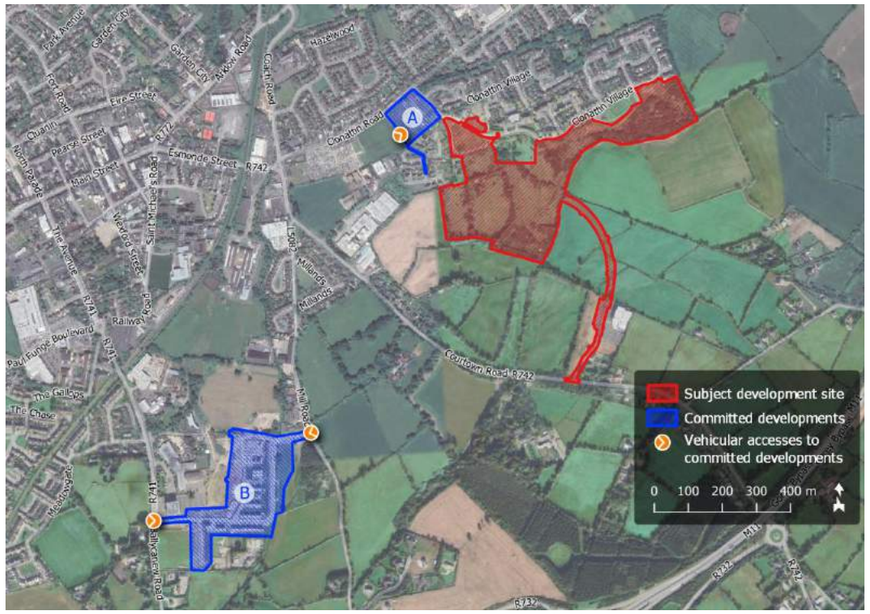

Figure 11-1 Relevant nearby committed developments (sources: Wexford Co. Co., OSM Contributors, Google)

Trips to be generated by the following permitted developments were included in all future year operational assessments:

(A) reg. ref. 20160823 (residential development of 32no. houses with vehicular access to/from Clonattin Road via Hillcrest Drive)

(B) reg. refs. 20170786 & 20180742 (residential development of 82no. units and associated 6-classroom crèche, with vehicular access to/from Ballycanew Road and Mill Road via a new link road between these – currently under construction)

The predicted trip generation for the above permitted developments is given in Table 11-4. Further detail on the calculation of these figures (including the relevant trip generation rates employed) is given in the Traffic Impact Assessment report prepared in support of this SHD planning application.

Peak Hour	Arrivals	Departures	Total Trips
REG. REF. 20160823			
AM Peak (08:15-09:15)	7	14	21
PM Peak (16:00-17:00)	11	8	19
REG. REFS. 20170786 & 20180742			
AM Peak (08:15-09:15)	44	57	101
PM Peak (16:00-17:00)	38	30	68

Table 11-4 Permitted Development Trip Generation

Vehicular Trip Distribution

Vehicular access to the proposed development from the existing surrounding road network shall be via 2no. junctions: the existing Clonattin Village access junction on Clonattin Road (to the north-west), and a proposed new link road junction on Courtown Road (to the south-east). The two junctions shall be connected by the development's internal road network, which includes a proposed new link road connecting Clonattin Road and Courtown Road, and it is assumed that any vehicle arriving to or departing from the development shall use whichever of the two access junctions is the more convenient for its origin or destination on the surrounding road network.

Vehicular traffic arriving to or departing from the development site is expected to enter or leave the immediate surrounding area via one of the following roads:

(A) Clonattin Road from/to the north-east;
(B) Courtown Road (R742) from/to the south-east;
(C) Mill Road (L5082) from/to the south;
(D) Esmonde Street (R742) from/to the west;
(E) Coach Road from/to the north.

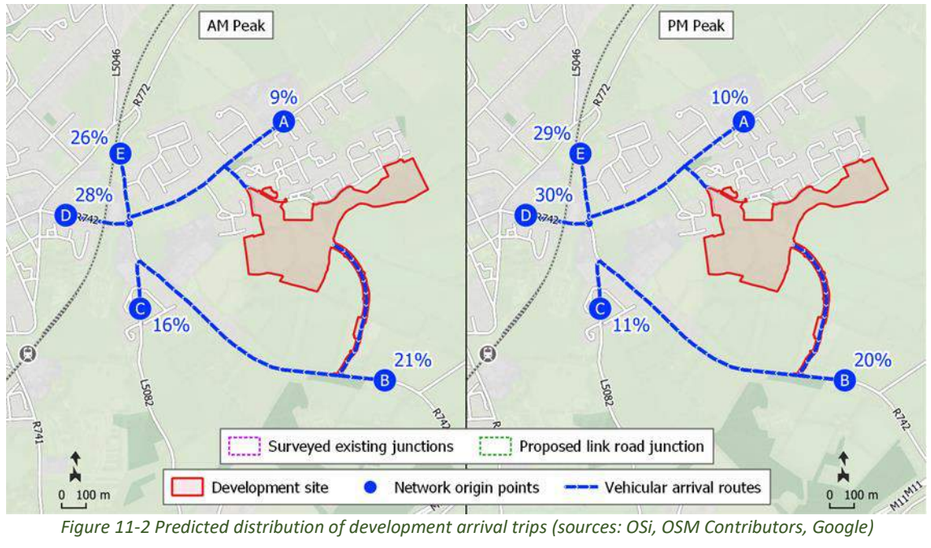

Figure 11-2 Predicted distribution of development arrival trips (sources: OSi, OSM Contributors, Google)

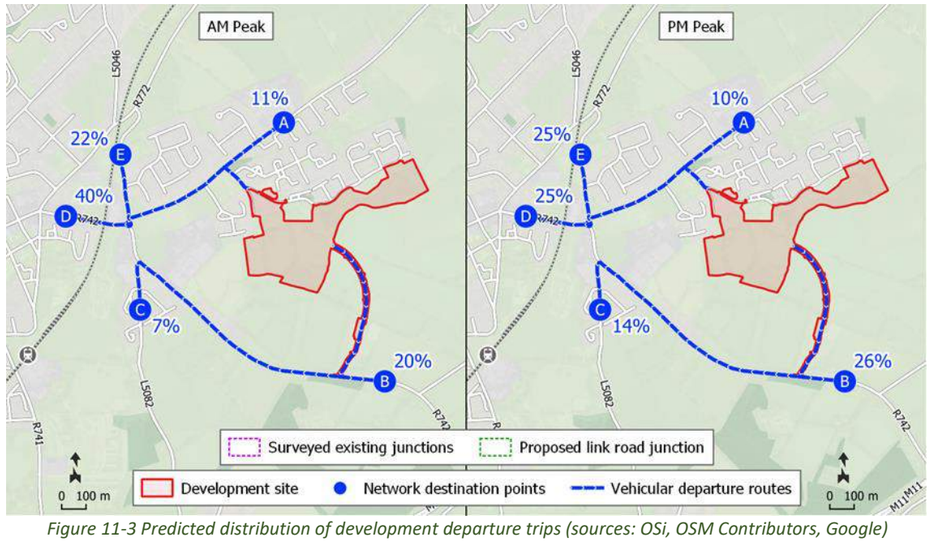

Figure 11-3 Predicted distribution of development departure trips (sources: OSi, OSM Contributors, Google)

The predicted distribution of vehicular trips to and from the subject development has been established following the proportions of the surveyed inbound and outbound mainline traffic flows at these five points on the local road network, in each of the peak hour periods. These proportions (for both arrivals and departures, in both of the peak

hour periods) are shown in Figure 11-2 and Figure 11-3. Also shown in these images are the mapped routes providing the predicted driving routes between the development site and each of the five network points.

Table 11-5 and Table 11-6 summarise the distribution of development arrival and departure trips according to the network point from which they arrive or to which they depart. These tables indicate the proportions and numbers of trips from/to each network point, the development access junction used in each case, and the other surveyed junctions through which they will pass.

Network Entry Point	Development Access Junction No.	Other Junctions Passed Through	% of AM Trips	% of PM Trips	Number of AM Trips	Number of PM Trips
A	4	5	9.30%	10.00%	7	12
B	6	-	20.70%	20.40%	15	24
C	6	3	15.80%	11.50%	12	14
D	4	2	28.10%	29.50%	21	35
E	4	2	26.00%	28.70%	19	34

Table 11-5 Distribution of Development Arrival Trips

Network Exit Point	Development Egress Junction No.	Other Junctions Passed Through	% of AM Trips	% of PM Trips	Number of AM Trips	Number of PM Trips
A	4	5	11.2%	9.6%	17	9
B	6	-	19.9%	25.6%	31	23
C	6	3	7.2%	14.1%	11	13
D	4	2	39.8%	25.1%	62	23
E	4	2	21.9%	25.6%	34	23

Table 11-6 Distribution of Development Departure Trips

Further detail of the trip distributions applied is given in the Traffic Impact Assessment report prepared in support of this SHD planning application.

Link Road Traffic Reallocation

As previously noted, the subject development shall include the provision of a new link road connecting Clonattin Road and Courtown Road (R742). It is expected that the provision of this link road shall result in the reallocation of the following existing background traffic, which at present must take a more circuitous route:

- vehicular traffic between Clonattin Road (to/from the north-east) and Courtown Road (to/from the south-east); and
- vehicular traffic between the existing Clonattin Village and Courtown Road.

The volumes of existing traffic under each of the above two categories, in each of the peak hour periods, have been determined through analysis of the existing inbound and outbound traffic flows at network points A and B (at survey junctions J5 and J3, as shown in Figure 11-2 and Figure 11-3), as well as the existing traffic flows to and from Clonattin Village (at survey junction J4).

The existing and reallocated routes of such traffic are shown in Figure 11-4 and Figure 11-5. The relevant reallocated peak hour traffic flow volumes are given in Table 11-7.

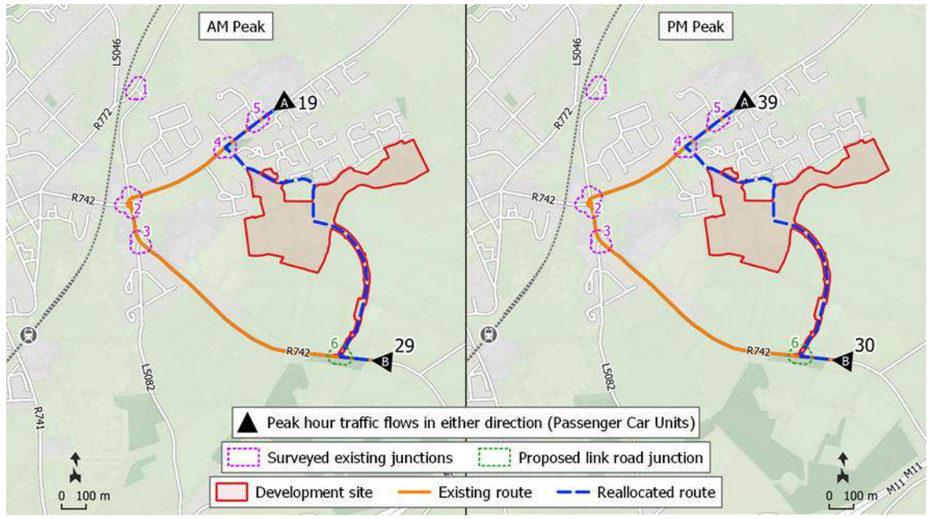

Figure 11-4 Reallocated traffic between Clonattin Rd and Courtown Rd (sources: OSi, OSM Contributors, Google)

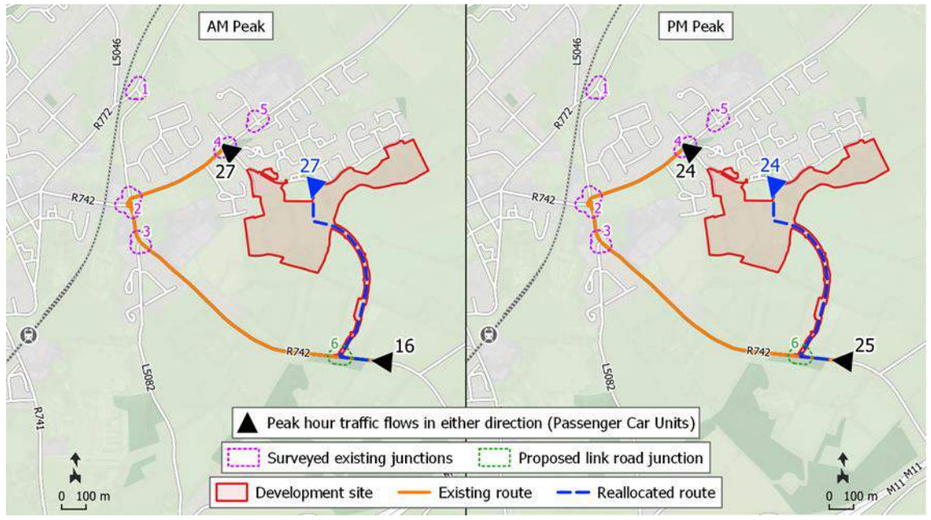

Figure 11-5 Reallocated traffic to/from existing Clonattin Village (sources: OSi, OSM Contributors, Google)

Peak Hour	Trips between Clonattin Rd and Courtown Rd			Trips between Clonattin Village (CV) and Courtown Rd		
	Northbound	Southbound	TOTAL	Arrivals to CV	Departures from CV	TOTAL
AM Peak	29	19	48	16	27	43
PM Peak	30	39	69	25	24	49

Table 11-7 Reallocated Background Traffic

Operational Assessment

The operational performance of the following 3no. existing and proposed road junctions was assessed using industry-standard TRANSYT and PICADY software (see Figure 11-6):

J2. Coach Rd / Clonattin Rd / Courtown Rd [R742] / Esmonde St [R742]
(existing 3-arm roundabout plus 3-arm priority-controlled junction)
J4. Clonattin Road / Clonattin Village
(existing 3-arm priority-controlled junction)
J6. Courtown Road [R742] / Proposed Link Road (existing cinema site)
(proposed upgrade of existing 3-arm priority-controlled junction)

Note: the assessed junctions have been numbered so as to be consistent with the numbering of the surveyed junctions (see Figure 11-11). Junction sites J1, J3, and J5 do not feature in the above list; these junctions were surveyed but have not been assessed by reason of the subject development's negligible proportional contribution to traffic volumes at these locations (refer to the sub-section 4.4 of the accompanying Traffic Impact Assessment).

Figure 11-6 Modelled road junctions (sources: OSM Contributors, Google)

The performances of these junctions have been assessed under the following scenarios:

- 2020 – existing baseline traffic conditions;
- 2038 (design year) – with & without subject development.

All 'with subject development' assessment scenarios include the redistribution of existing background traffic between Clonattin Road and Courtown Road that shall result from the provision of the proposed link road. For all assessment years, the surveyed 2019 background traffic flows were scaled up using standard growth factors sourced from Unit 5.3 of the TII *Project Appraisal Guidelines* (PE-PAG-02017 *Travel Demand Projections*).

In addition to the above primary assessment scenarios, a supplementary sensitivity assessment has been carried out for the design year 2038, including potential traffic flows to be generated by the future development of a primary school on the adjoining site to the north of the subject site. The results of this sensitivity assessment are presented in section 11.10 of this EIAR chapter.

Junction performance was assessed under the following criteria, for each junction approach arm:

- Degree of Saturation (the ratio of current traffic flow to ultimate capacity on a link or traffic stream);
- Mean Maximum Queue (the highest estimated mean number of Passenger Car Units queued in any lane of a junction approach link, averaged over the entire analysis period);
- Mean Delay per PCU (the average delay incurred by a vehicle on a junction approach); and
- Practical Reserve Capacity (the percentage by which the arriving traffic flow on a stream could increase before the stream would reach its effective capacity).

11.3 RECEIVING ENVIRONMENT

Location

The site of the proposed development lies between Clonattin Road and Courtown Road (R742) in the townlands of Clonattin Upper and Goreybridge, Gorey, Co. Wexford. The application site has a total area of 15.7ha and is located within the administrative jurisdiction of Wexford County Council.

The subject site is predominantly greenfield and currently generates no vehicular traffic. A derelict dwelling and associated shed are located within the western part of the site, and an existing pond is located inside the site's southern boundary.

The location of the proposed development site is shown in Figure 11-7; the indicative extents of the development site, as well as relevant elements of the surrounding road network, are shown in more detail in Figure 11-8.

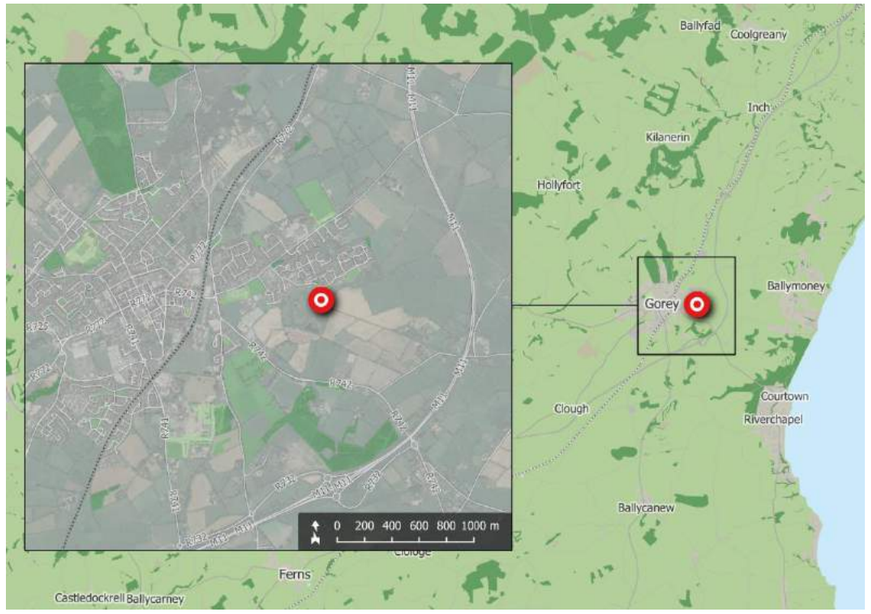

Figure 11-7 Location of proposed development site (sources: EPA, OSM Contributors, Google)

The main body of the development site is bounded to the north generally by the existing Clonattin Village access road, to the north-west by the existing Hillcrest residential development, and on all other sides by undeveloped agricultural lands. The application boundary also includes the alignment corridor of a new link road that shall

connect Courtown Road (R742) to Clonattin Village and Clonattin Road. The provision of such a link is given as a roads objective in the *Gorey Local Area Plan 2017–2023*.

Figure 11-8 Site extents and surrounding transport infrastructure (sources: NTA, OSM Contributors, Google)

The internal road network of the proposed development shall tie in to the existing Clonattin Village access road at 6no. locations along the site's northern boundary. Access to the wider road network from these points shall be via the existing Clonattin Village access junction on Clonattin Road. To the south, the proposed new link road traversing the development site shall tie in to the existing junction on Courtown Road that gives access to the existing Movies@Gorey cinema site.

Existing Road Network

Relevant elements of the existing road network in the immediate vicinity of the subject site include the Clonattin Village access road, Clonattin Road, and Courtown Road (R742). The characteristics of these roads are given below.

<u>Clonattin Village access road</u>

- Single carriageway road with a pavement width of between 5.5m and 7.5m.
- Local access road with an east-west alignment generally, connecting to Clonattin Road in the west and giving access to the existing Clonattin Village residential development.
- Subject to a 30km/h speed limit.
- Raised footpaths are present along both sides of the road in the vicinity of its junction with Clonattin Road, extending the full length of the road on its northern side. No cycle tracks or bus lanes are present.
- On-street parking is generally not permitted on the Clonattin Village access road.

<u>Clonattin Road</u>

- Single carriageway road with a pavement width of approx. 7m generally in the vicinity of its junction with the Clonattin Village access road.
- Local road with a NE-SW alignment, connecting to the R742 (Esmonde Street) in the south-west, leading to Gorey town centre.
- Subject to a 50km/h speed limit in the vicinity of its junction with the Clonattin Village access road and as far as its junction with the R742.
- Raised footpaths are present along both sides of Clonattin Road between its junction with the R742 and a point approx. 230m beyond its junction with the Clonattin Village access road, extending for a further 390m on the southern side only. No cycle tracks or bus lanes are present.
- On-street parking is generally not prohibited on Clonattin Road.

<u>Courtown Road (R742)</u>

- Single carriageway road with a pavement width of approx. 9m in the vicinity of the proposed new link road junction (the existing access junction of the Movies@Gorey cinema site).
- Regional road with a NW-SE alignment generally, leading into Gorey town centre in the north-west and continuing to Courtown in the south-east. Provides a connection to Junction 23 of the M11 motorway via the Courtown Road Roundabout, approx. 800m south-east of the proposed new link road junction.
- Subject to an 80km/h speed limit in the vicinity of the proposed new link road junction.
- A raised footpath is present along the full length of Courtown Road between Esmonde Street and the Courtown Road Roundabout. No cycle tracks or bus lanes are present.

Site Accessibility – Walking and Cycling

Figure 11-9 and Figure 11-10 show walking and cycling times from the development site, as well as relevant public transport service points in the vicinity.

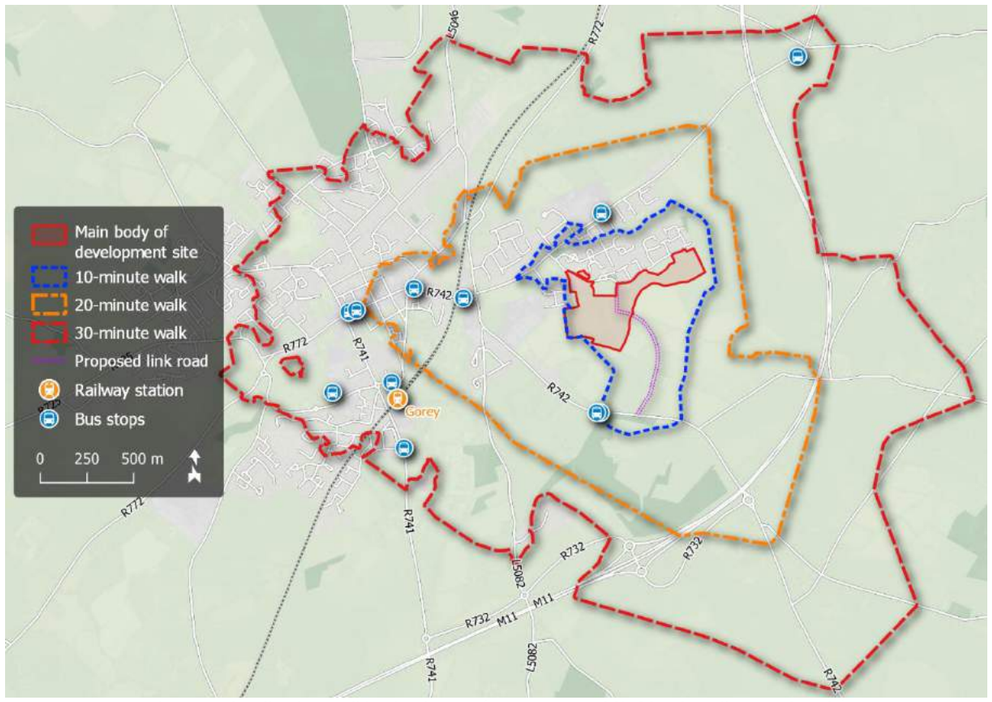

Figure 11-9 Indicative Walking isochrones (sources: NTA, OSi, OSM Contributors, Google)

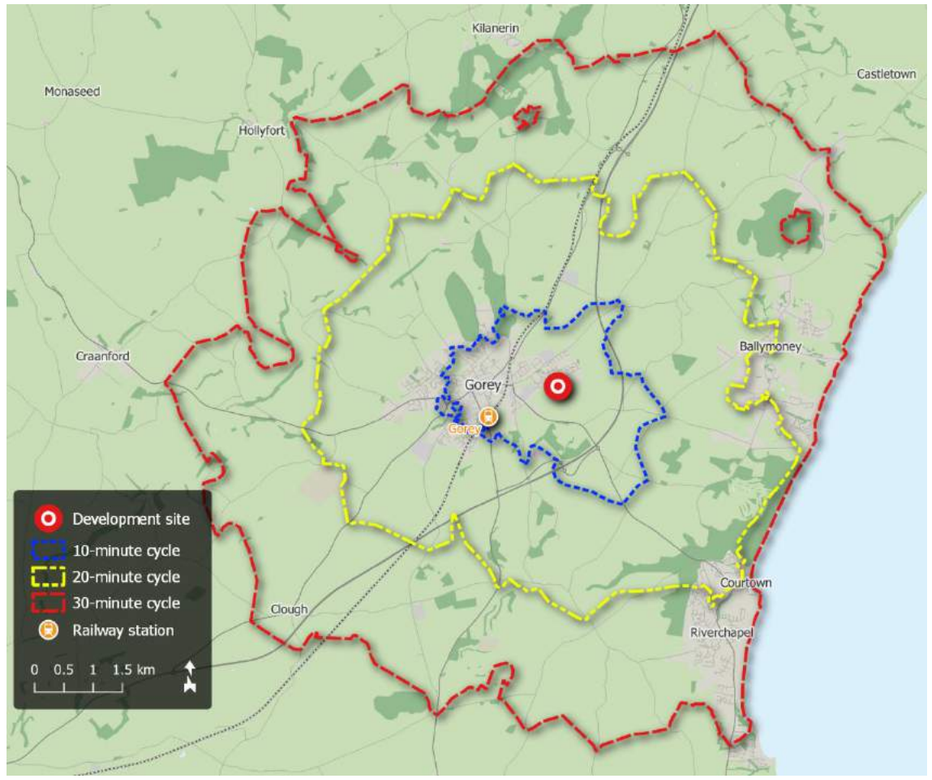

Figure 11-10 Indicative Cycling isochrones (sources: EPA, OSi, OSM Contributors)

Existing Traffic Conditions

A 12-hour classified vehicular traffic count survey was undertaken on Tuesday the 19th of November 2019 by Traffinomics Limited, on behalf of CS Consulting. This survey was conducted between 07:00 and 19:00 at 5no. sites on Clonattin Road, Courtown Road, and Coach Road. The surveyed traffic flows were then scaled up using TII growth factors to obtain background traffic flows for the baseline year of 2020.

The following existing junction sites were surveyed (see Figure 12.7):

J1. Arklow Road [R772] / Coach Road
(3-arm priority-controlled junction)
J2. Coach Rd / Clonattin Rd / Courtown Rd [R742] / Esmonde St [R742]
(3-arm roundabout plus 3-arm priority-controlled junction)
J3. Courtown Road [R742] / Mill Road [L5082]
(3-arm priority-controlled junction)
J4. Clonattin Road / Clonattin Village
(3-arm priority-controlled junction)
J5. Clonattin Road / Clonattin Estate
(3-arm priority-controlled junction)

The weekday peak hour background traffic flows across all survey sites were found to occur between 08:15 and 09:15 (AM peak hour) and between 16:00 and 17:00 (PM peak hour).

Figure 11-11 Locations of traffic survey sites (sources: OSM Contributors, Google)

Time Period	**Total Surveyed Junction Traffic Movements** (in Passenger Car Units)				
	J1	J2	J3	J4	J5
2019 – SURVEY YEAR					
AM Peak (08:15-09:15)	1507	1380	779	489	299
PM Peak (16:00-17:00)	1433	1732	1055	536	347
2020 – BASELINE YEAR					
AM Peak (08:15-09:15)	1530	1401	791	496	303
PM Peak (16:00-17:00)	1454	1758	1071	544	352

Table 11-8 Total Peak Hour Traffic at Surveyed Junctions

Existing Road Network Operation

Junction Approach Arm	Degree of Saturation (%)		Maximum Queue (PCU)		Mean Delay per PCU (seconds)		Practical Reserve Capacity (%)	
	AM	PM	AM	PM	AM	PM	AM	PM
Junction 2								
Coach Road (to north)	44	52	0	0	1	2	104	75
Clonattin Road (to east)	55	50	0	0	4	4	62	81
Courtown Road (to south)	44	58	0	0	1	2	106	56
Esmonde Street (to west)	32	46	0	0	1	2	184	96
Junction 4								
Clonattin Road (to N-E)	n/a	n/a	n/a	n/a	n/a	n/a	151	243
Clonattin Village (to S-E)	31	18	0	0	9	7		
Clonattin Road (to S-W)	11	18	0	0	6	7		
Junction 6								
Courtown Road (to west)	n/a	n/a	n/a	n/a	n/a	n/a	900	246
Cinema Site (to north)	0	6	0	0	0	9		
Courtown Road (to east)	0	0	0	0	0	0		

Table 11-9 Junction assessment results for Baseline Year 2020

Table 11-9 shows the TRANSYT and PICADY modelling results for the baseline year 2020. These show that the 3no. existing junctions that were surveyed and modelled currently operate well within their effective capacities on all approaches during the AM and PM peak hour periods. Queues on all junction approaches are negligible and mean vehicle delays are minimal.

11.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

Development Description

The proposed strategic housing development at this site in Clonattin, Gorey will include the demolition of the existing buildings and will provide 363no. residential units, a crèche, public open space, a new access road connecting to Courtown Road. All associated site development works and services provisions including parking, bin storage, substations, landscaping and all services required to facilitate the proposed development.

A full description is provided in the statutory notices and in Chapter 3 of the EIAR.

Site Access Arrangements

The subject development's internal road network shall tie into the existing surrounding road network at 7no. locations to give vehicular access to the development (see Figure 11-8).

The 2no. primary vehicular access points are:
(A) a new priority junction on Clonattin Village Road at the northern boundary of the subject development; and
(B) the northward continuation of Cinema Road, which originates at Courtown Road approx. 640m to the south-east.

A further 5no. vehicular access points shall be located on Clonattin Village Road at the northern boundary of the development. Provision is also made for future connectivity between the subject development and adjacent development of the lands to the south at 2no. locations within the subject development, in accordance with the *Gorey Local Area Plan 2017–2023*.

All connections between the development's internal road network and the existing external road network have been designed in accordance with the requirements of the *Design Manual for Urban Roads and Streets*. For further detail of the development's proposed provisions for vehicular access to/from the surrounding road network, refer to the accompanying Road Infrastructure Design Report prepared by CS Consulting and to the drawings referenced therein.

Car and Bicycle Parking

The proposed development shall include a total of 690no. car parking spaces at grade. The majority of these shall be located within house curtilages and within small dedicated parking areas serving apartment and duplex units. A number of on-street parking spaces shall also be provided. Car parking for houses shall be provided at the rate of 2no. spaces per house (524no. spaces in total), meeting the requirements of the County Development Plan. Each apartment and duplex unit shall have 1no. allocated car parking space (101no. spaces in total), in line with the recommendations of the 2018 *Apartment Guidelines*. 19no. car spaces (including 4no. set down spaces) shall be provided for the development's crèche. The balance of the development's car parking provision shall be allocated to visitor use.

The development shall also include a total of 222no. bicycle parking spaces. These include 212no. spaces for apartment and duplex units (in line with the recommendations of the 2018 *Apartment Guidelines*) and 10no. spaces to serve the development's crèche (in accordance with the *National Cycle Manual*).

Refer to Section 6 of the accompanying Traffic Impact Assessment report for full details of the subject development's proposed car and bicycle parking provisions.

11.5 POTENTIAL IMPACTS

Construction Phase

Junction performance assessment has not been conducted for the construction phase of the development.

As an indicative estimate, development traffic during the construction phase is likely to reach at most 80 vehicle movements per day at its peak (a maximum of approx. 16PCU/hr in each peak hour period, including both arrivals and departures). Consequently, the impact of construction traffic on the operation of the surrounding road network shall be less significant than the impact of operational traffic related to the subject development.

During the construction phase, the subject development is therefore likely to result in a short-term slight adverse impact on the operational efficiency of the 5no. existing junctions assessed, in comparison to the Baseline Scenario. This impact should be considered fully reversible, as it shall be confined to the duration of construction activity on the subject site.

It is also recognised that there is potential during the construction phase for construction-related activity to impact upon the surrounding road network in ways beyond the operational performance of the junctions assessed. These further impacts would potentially take the form of surrounding roads being temporarily obstructed by stopped/parked construction vehicles or by delivery/loading operations, or their condition being temporarily degraded by the presence of dirt/debris originating from the construction site. The construction phase mitigation measures detailed in section 11.7 of this EIAR chapter are intended specifically to minimise such impacts, and these measures shall be strictly adhered to.

Operational Phase

In traffic and transport terms, the potential impacts of the proposed development on the surrounding environment during the operational phase are equivalent to the predicted impacts described in section 11.8 of this EIAR chapter.

11.6 POTENTIAL CUMULATIVE IMPACTS

As is standard in the evaluation of traffic impact, the future year junction performance assessments conducted in respect of the proposed development include traffic flows to be generated by other nearby committed developments. The predicted operational phase impacts described in section 11.8 of this EIAR chapter therefore also represent the potential cumulative impacts.

11.7 MITIGATION MEASURES

Construction Phase

The lead contractor appointed for the construction of the development shall be required to prepare a Construction Management Plan (CMP) that shall include a plan for the scheduling and management of construction traffic. This CMP shall outline measures to be taken to mitigate the impact of construction traffic on the surrounding road network.

Such measures are expected to include:

- Prohibition of haulage vehicles parking at the entrance to the site or stopping along their access routes.
- Limiting the number of haulage vehicles travelling in convoy to a maximum of two vehicles at any time.
- Maintaining a minimum separation of 250m at all times between haulage vehicles travelling to and from site.
- Conducting all loading of excess material within the site boundary.

In addition, it is expected that construction-related vehicle movements shall be minimised through:

- Consolidation of delivery loads to/from the site.
- Scheduling large deliveries to occur outside of peak periods.
- Use of precast/prefabricated materials where possible.
- Reuse on site wherever possible of 'cut' material generated by the construction works.
- Provision of adequate storage space on site for material and plant.
- Promoting the use of public transport by construction personnel.

To minimise the impact of dirt and debris associated with construction, the following measures shall be taken to ensure that the site and surrounding public roads are kept clean and tidy:

- A regular program of site tidying shall be established to ensure a safe and orderly site.
- Scaffolding shall have debris netting attached to prevent materials and equipment being scattered by the wind.
- Food waste shall be strictly controlled on all parts of the site.
- Mud spillages on roads and footpaths outside the site shall be cleaned regularly and shall not be allowed to accumulate.
- Wheel wash facilities shall be provided for vehicles exiting the site.
- In the event of any fugitive solid waste escaping the site, it shall be collected immediately and removed.

Operational Phase

As described in the accompanying Traffic Impact Assessment report, the development shall incorporate several design elements intended to mitigate the impact of the development on the operation of the surrounding road network. These include:

- an appropriate level of car parking provision, in line with Local Authority Development Plan standards (for houses) and Apartment Guidelines recommendations (for apartments and duplexes), which shall discourage excessively high vehicle ownership rates and unnecessary vehicular trips to the development (by residents and visitors); and
- a high provision of secure bicycle parking, which shall serve to encourage bicycle journeys by both residents and visitors.

As described in the accompanying Residential Travel Plan document, a Residential Travel Plan Coordinator shall be appointed for the proposed development, with the remit to implement and oversee an ongoing Residential Travel Plan (RTP). This shall assist residents and their visitors in making the most of sustainable transport opportunities and in avoiding single-occupant car journeys where possible. Briefly, the following mobility management measures are proposed under the Residential Travel Plan:

- Creation of an Access Map.
- Provision of travel information to development occupants, in the form of Sustainable Travel Welcome Packs and a travel hub website.
- Identification of safe walking and cycling routes.
- Provision of secure and attractive cycle parking and ancillary facilities for cyclists and pedestrians.
- Provision of information on locations of public transport stops, routes, timetables, walking times to main public transport facilities, etc.
- Provision of specific advice to development occupants on multi-modal trip planning.

11.8 PREDICTED IMPACTS

Construction Phase

In traffic and transport terms, the predicted impacts of the proposed development on the surrounding environment during the construction phase are generally equivalent to the potential impacts described in section 11.5 of this EIAR chapter.

It is however predicted that the construction phase mitigation measures detailed in section 11.7 of this EIAR chapter shall reduce to a negligible level the risk of the surrounding roads being obstructed by construction activity or their condition degraded by construction-related dirt or debris.

Operational Phase

Table 11-10 shows the TRANSYT and PICADY modelling results for the design year 2038 under the Do-Nothing Scenario (without the subject development). Traffic flows modelled under this scenario include existing background traffic, scaled up to 2038 levels using standard TII growth factors, as well as predicted traffic flows generated by the permitted and planned developments previously described.

Junction Approach Arm	Degree of Saturation (%)		Maximum Queue (PCU)		Mean Delay per PCU (seconds)		Practical Reserve Capacity (%)	
	AM	PM	AM	PM	AM	PM	AM	PM
Junction 2								
Coach Road (to north)	51	59	0	0	2	2	78	53
Clonattin Road (to east)	64	57	1	0	6	5	40	57
Courtown Road (to south)	52	65	0	1	2	3	74	38
Esmonde Street (to west)	36	53	0	0	1	2	148	71
Junction 4								
Clonattin Road (to N-E)	n/a	n/a	n/a	n/a	n/a	n/a	129	213
Clonattin Village (to S-E)	34	20	1	0	10	8		
Clonattin Road (to S-W)	12	20	0	0	6	7		
Junction 6								
Courtown Road (to west)	n/a	n/a	n/a	n/a	n/a	n/a	900	215
Cinema Site (to north)	0	7	0	0	0	10		
Courtown Road (to east)	0	0	0	0	0	0		

Table 11-10 Junction assessment results for Design Year 2038 (Do-Nothing Scenario)

These results show that the 3no. existing junctions modelled shall continue to operate well within their effective capacities on all approaches during the AM and PM peak hour periods past the year 2038. Queues and delays on all junction approaches shall remain at levels similar to those currently existing.

Table 11-11 gives the TRANSYT and PICADY modelling results for the design year 2038. under the Do-Something Scenario (with the subject development in place). Traffic flows modelled under this scenario are those of the Do-Nothing Scenario, with the addition of the predicted traffic flows generated by the subject development and the redistribution of some existing background traffic via the proposed new link road that forms part of the development.

Junction Approach Arm	Degree of Saturation (%)		Maximum Queue (PCU)		Mean Delay per PCU (seconds)		Practical Reserve Capacity (%)	
	AM	PM	AM	PM	AM	PM	AM	PM
Junction 2								
Coach Road (to north)	55	57	0	0	2	2	63	57
Clonattin Road (to east)	76	54	1	0	11	4	19	66
Courtown Road (to south)	50	61	0	0	2	3	80	46
Esmonde Street (to west)	38	55	0	0	1	2	134	62
Junction 4								
Clonattin Road (to N-E)	n/a	n/a	n/a	n/a	n/a	n/a	41	105
Clonattin Village (to S-E)	61	35	2	1	17	11		
Clonattin Road (to S-W)	18	29	0	0	7	8		
Junction 6								
Courtown Road (to west)	n/a	n/a	n/a	n/a	n/a	n/a	234	131
New Link Road (to north)	17	26	0	0	7	9		
Courtown Road (to east)	11	14	0	0	6	6		

Table 11-11 Junction assessment results for Design Year 2038 (Do-Something Scenario)

These results show that the 3no. modelled junctions shall continue to operate well within their effective capacities on all approaches during the AM and PM peak hour periods past the year 2038, with the subject development in place. In the design year, the addition of vehicular traffic generated by the subject development, combined with the effect of traffic redistribution via the proposed new link road, shall result in a maximum increase of 1 Passenger Car Unit in any junction approach queue length, and a maximum increase of 7 seconds in mean vehicle delay on any junction approach.

During the operational phase, the subject development is therefore predicted to result in a long-term slight adverse impact on the operational efficiency of the 3no. junctions assessed, in comparison to the Do-Nothing Scenario. This impact should be considered reversible to a degree, as any future measures that reduce local vehicular traffic volumes (e.g. improvements in public transport or cycling infrastructure, junction redesign, or changes in general traffic flow restrictions) have the potential to improve the operational efficiency of these junctions generally, as well as to reduce vehicle trips to/from the subject development.

11.9 'DO NOTHING' SCENARIO

The 'Do-Nothing' scenario with respect to traffic impact is presented in section 11.8 of this EIAR chapter (see Table 11-10), in which it is contrasted with the design year 'Do-Something' scenario in order to quantify the development's predicted operational phase impact.

11.10 WORST CASE SCENARIO

Construction Phase

During the construction phase, the worst-case scenario is represented by a failure to correctly manage construction-related traffic and site-generated dirt/debris, resulting in temporary obstruction or fouling of surrounding roads as discussed in section 11.5 of this EIAR chapter. As previously noted, the construction phase mitigation measures detailed in section 11.7 of this EIAR chapter are intended specifically to minimise the risk of such occurrences, and these measures shall be strictly adhered to.

Operational Phase

A site adjoining the subject site at its northern boundary (shown in Figure 11-12) is zoned for Community and Education (CE) use and, for the purposes of this worst-case scenario assessment, has been identified as the potential location for a future primary school comprising approximately 16no. classrooms. In the evaluation of the subject development's operational traffic impact, the worst-case scenario is represented by the addition of vehicular traffic generated by a future school on this site to the design year traffic flows already considered under the 'Do-Something' scenario.

It is assumed that any future school development at this site would be contingent upon the completion of the link road that forms part of the subject proposed development. As no specific plans have yet been made for such a school, it is further assumed that no vehicular traffic flows generated by it would be present on the local road network before the design year of 2038.

Figure 11-12 Site of potential future primary school development (sources: OSM Contributors, Google)

In the 2019/2020 school year, the average class size across all primary schools in Gorey was 25 pupils. Assuming little fluctuation in this figure over the coming years, a 16-classroom primary school at this location may be expected to accommodate approximately 400 pupils.

The peak hour trip generation for this potential future school has been calculated using trip factors from the TRICS database under the sub-category '04 Education / A – Primary'; these are given in Table 11-12. The resultant arrival and departure flows for the school (on the basis of 400 pupils) are given in Table 11-13.

Peak Hour	Arrivals per pupil	Departures per pupil
AM Peak (08:15-09:15)	0.131	0.086
PM Peak (16:00-17:00)	0.023	0.042

Table 11-12 TRICS Primary School Trip Generation Rates

Peak Hour	Arrivals	Departures	Total Trips
AM Peak (08:15-09:15)	52	34	86
PM Peak (16:00-17:00)	9	17	26

Table 11-13 Potential Future School Trip Generation

Table 11-14 shows the TRANSYT and PICADY modelling results for the design year 2038 under the supplementary Worst Case scenario assessment. Traffic flows modelled under this scenario include existing background traffic, scaled up to 2038 levels using standard TII growth factors, as well as predicted traffic flows generated by the permitted and planned developments previously described, the predicted traffic flows generated by the subject development, the redistribution of some existing background traffic via the proposed new link road, and the potential traffic flows generated by the potential future primary school.

These results show that all approaches to the 3no. modelled junctions remain within their effective capacities under this scenario, with a maximum degree of saturation of 80% reached on any junction approach in either peak hour period.

Junction Approach Arm	Degree of Saturation (%)		Maximum Queue (PCU)		Mean Delay per PCU (seconds)		Practical Reserve Capacity (%)	
	AM	PM	AM	PM	AM	PM	AM	PM
Junction 2								
Coach Road (to north)	57	58	0	0	2	2	58	55
Clonattin Road (to east)	80	56	2	0	14	5	12	61
Courtown Road (to south)	51	62	0	0	2	3	78	46
Esmonde Street (to west)	40	56	0	0	1	2	125	61
Junction 4								
Clonattin Road (to N-E)	n/a	n/a	n/a	n/a	n/a	n/a	30	97
Clonattin Village (to S-E)	66	37	2	1	19	11		
Clonattin Road (to S-W)	23	29	0	0	7	8		
Junction 6								
Courtown Road (to west)	n/a	n/a	n/a	n/a	n/a	n/a	209	125
New Link Road (to north)	19	27	0	0	7	9		
Courtown Road (to east)	12	14	0	0	6	6		

Table 11-14 Additional sensitivity assessment results for Design Year 2038 (Worst Case Scenario)

11.11 MONITORING & REINSTATEMENT

Construction Phase

The lead contractor appointed for the construction of the development shall be required to prepare a Construction Management Plan (CMP) that shall include a plan for the scheduling and management of construction traffic. This CMP shall outline measures for monitoring the impact of construction traffic on the operation and condition of the surrounding street network, including remedial actions to be taken in the event of construction traffic causing damage to road infrastructure.

Operational Phase

As described in the accompanying Residential Travel Plan document, a Residential Travel Plan Coordinator shall be appointed for the proposed development, with the remit to implement and oversee an ongoing Residential Travel Plan (RTP). In conjunction with this, the Residential Travel Plan Coordinator shall be responsible for monitoring the travel habits of development occupants and visitors.

An RTP is a dynamic process whereby a package of measures and campaigns is identified, piloted, and then monitored on an ongoing basis. The RTP will identify specific targets against which the effectiveness of the plan can be assessed at each review; these will typically take the form of target modal splits for journeys to and from a site. The Residential Travel Plan Coordinator shall gather data on travel patterns, for instance by conducting periodic travel surveys of development occupants.

Post-development monitoring of the surrounding street network's performance is not required or proposed in this case.

11.12 DIFFICULTIES IN COMPILING INFORMATION

No significant difficulties were experienced in compiling this Chapter of this EIAR document.

11.13 REFERENCES

- Wexford County Council (2013): *Wexford County Development Plan 2013–2019*
- Wexford County Council (2017): *Gorey Local Area Plan 2017–2023*
- Department of Housing, Planning and Local Government (2018): *Sustainable Urban Housing: Design Standards for New Apartments (Guidelines for Planning Authorities)*
- Department of Transport, Tourism and Sport (2019): *Design Manual for Urban Roads and Streets* (DMURS)
- National Transport Authority (2011): *National Cycle Manual*
- TRICS Consortium: Trip Rate Information Computer System (TRICS)
- Transport Infrastructure Ireland (2011): *Project Appraisal Guidelines*
- Transport Infrastructure Ireland (2014): *Traffic and Transport Assessment Guidelines*
- The Chartered Institution of Highways and Transportation (1994): *Guidelines for Traffic Impact Assessments*
- Environmental Protection Agency (2017): *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*
- Central Statistics Office: 2016 Census Data

12 MATERIAL ASSETS

12.1 INTRODUCTION

This chapter of the EIAR assesses and evaluates the likely impact of the proposed development on existing surface water and foul drainage, and utility services in the vicinity of the site, as well as identifying proposed mitigation measures to minimise any impacts.

The material assets considered in this chapter of the EIAR include Surface Water Drainage, Foul Drainage, Water Supply, Power, Gas and Telecommunications. This chapter was completed with input from CS Consulting Engineers and JAK Consulting Engineers.

12.2 METHODOLGY

The methodology followed for this section is in accordance with the EPA "Draft Guidelines on the Information to be contained in Environmental Impact Assessment Reports, Draft August 2017". Information on built assets in the vicinity of the development lands was assembled from the following sources:

- A desktop review of Irish Water Utility Plans, ESB Networks Utility Plans, Gas Networks Ireland Service Plans, Eir E-Maps and Virgin Media Maps;
- Consultation with Irish Water and Wexford County Council;
- Submission of a Pre-Connection Enquiry Application to Irish Water;
- Site Inspection / Walkover.

12.3 RECEIVING ENVIRONMENT

Surface Water Drainage

There is an existing 600mm diameter public storm drain traversing the development site where it outfalls into an existing attenuation pond constructed as part of the Clonattin Village development directly to the north. The attenuation pond was constructed to store approximately ***6050 cubic metres*** of storm water (7,500m3 when you include the freeboard) which allowed for the future discharge of surface water runoff of the applicant lands to discharge into. The existing attenuation pond caters in excess of the 1 in 100 year storm event across both developments.

Foul Drainage

Wexford County Council's drainage records indicate a 300mm diameter uPVC foul sewer running through the subject site, from Clonattin Village towards Courtown Road to south-west of the proposed development.

Water Supply

Records obtained from Wexford County Council's records indicate a 150mm diameter uPVC public watermain on Clonattin Village to the north of the proposed development.

Gas

There is no provision in the immediate area for connection to a gas network.

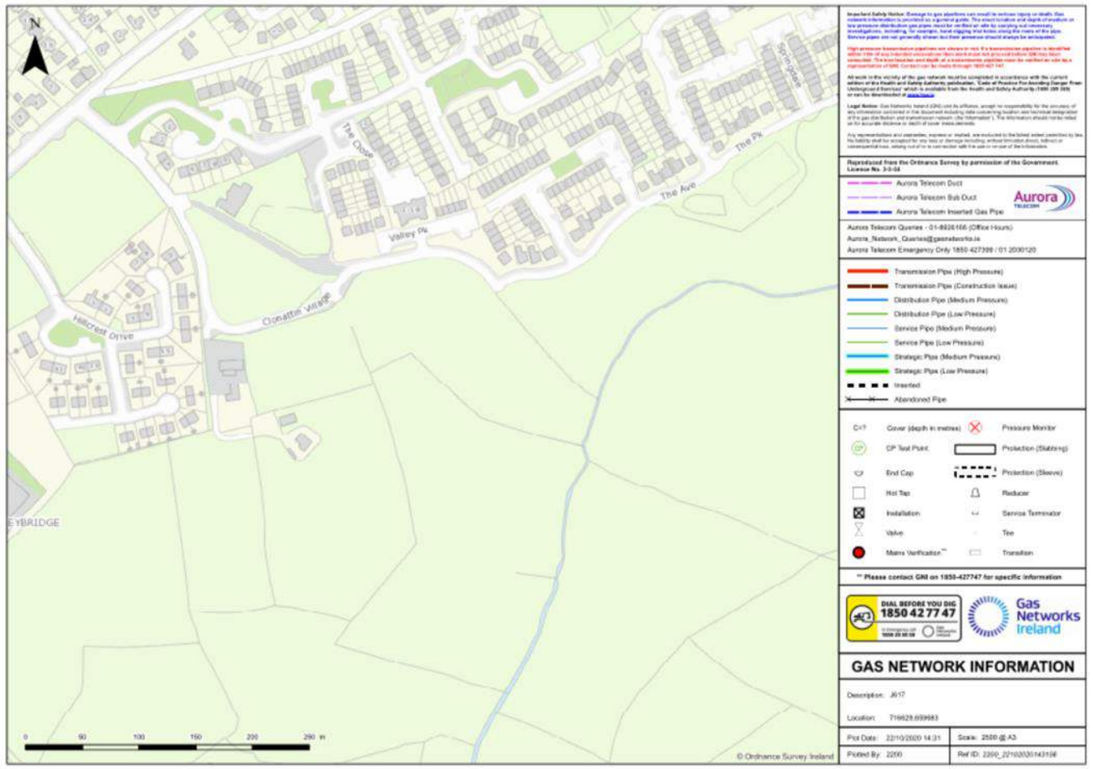

Figure 12-1 No Existing Gas Network. Source: Gas Networks Ireland

ESB

The site is bound by a series of both underground and traversing overhead MV Supplies.

To the North of the Site (Clonattin Road), there is provision to connect to an existing ESB Ring-main underground (ducted) supply serving Clonattin Village. The ESB Network map for the area is included in this report. The network will be tapped into by ESB to bring the network expansion on to the site. This may be done from either the north or south site boundary by redirection of overhead supplies to underground.

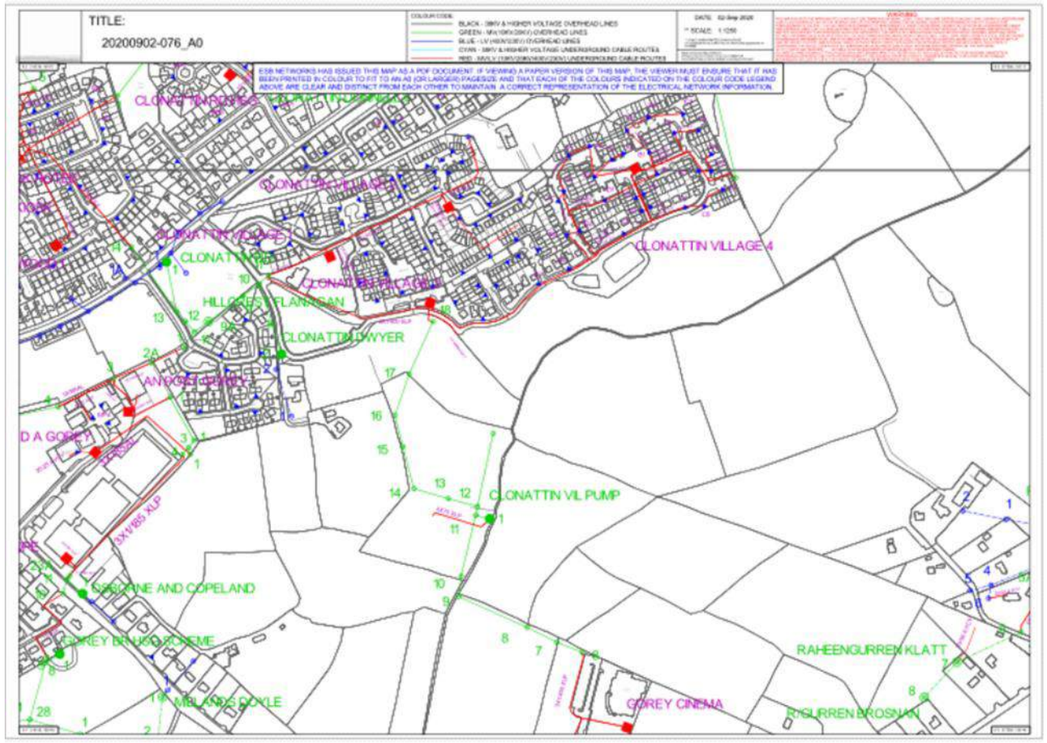

Figure 12-2 Existing ESB Network Bounding Site

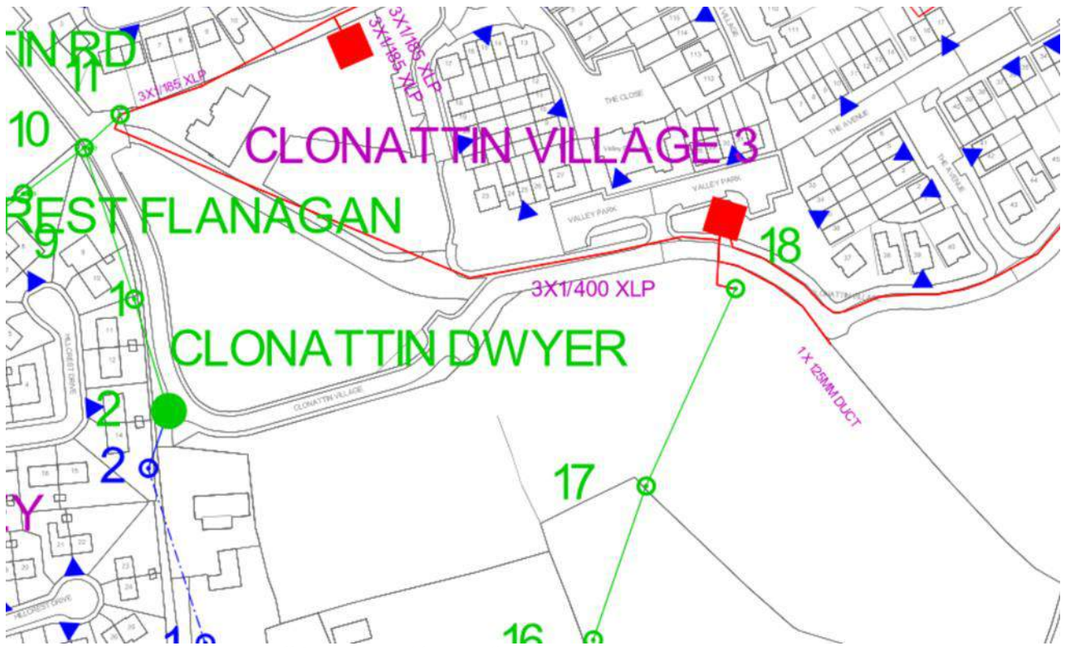

Figure 12-3 Existing ESB Network off Clonattin Road (Enlarged)

Telecommunications

Eir

There is existing underground Eir service provision along the north boundary of the site (Clonattin Road). The Eir Network map for the area is included in this report. The future service will be tapped into the current Eir Network to bring the services on to the site. This may be done from the north site boundary through underground servicing.

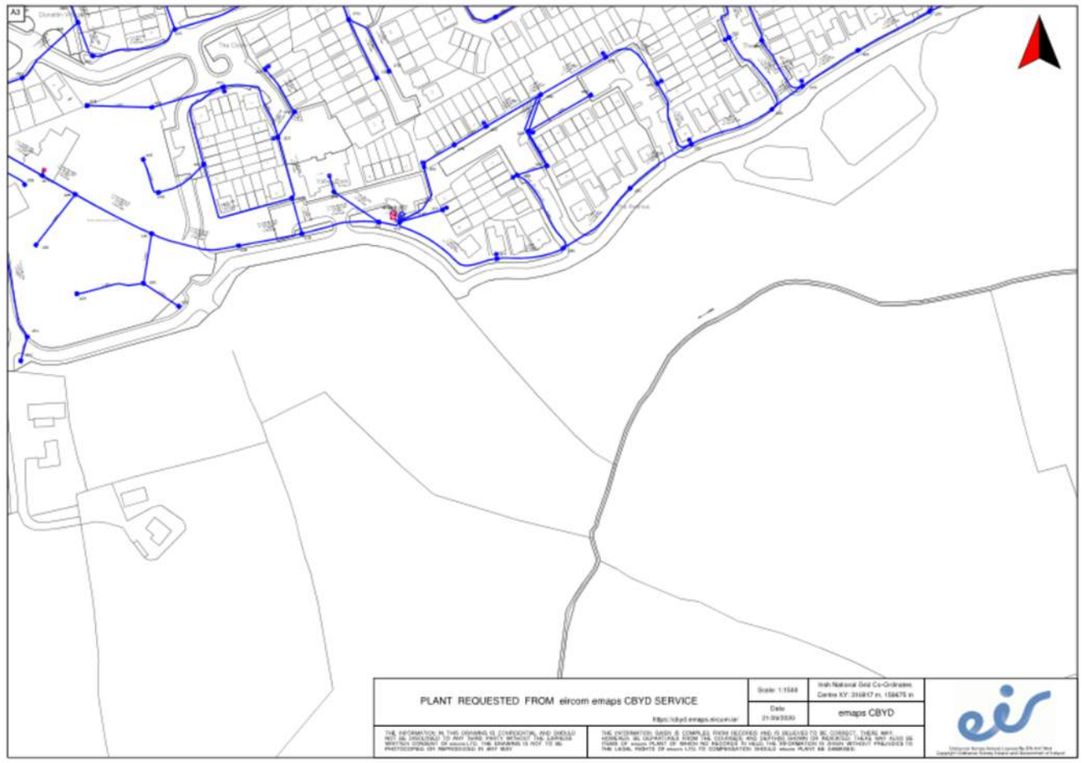

Figure 12-4 Existing Eir Services Bounding Site

Virgin Media

There is existing underground Virgin Media service provision along the north boundary of the site (Clonattin Road). The Virgin Media Network map for the area is included in this report. The future service will be tapped into the current Virgin Media Network to bring the services on to the site. This may be done from the north site boundary through underground servicing.

Figure 12-5 Existing Virgin Media Services Bounding Site

12.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

Overview

The proposed strategic housing development at Clonattin, Gorey, Wexford will provide 363 no. residential units, a creche, a linear park, car and cycle parking, and a new access road to the east. All associated site development works and services provisions including bin storage areas, substations, open spaces, boundary treatments, landscaping and all services required to facilitate the proposed development. A full description is provided in the statutory notices and in Chapter 3 of the EIAR.'

Surface Water Drainage

As part of the new development the existing 600mm surface water pipe shall be diverted as necessary to correspond with the proposed road network of the new development and retain its outfall connection to the existing attenuation pond.

The proposed development will discharge into the existing attenuation pond constructed as part of the Clonattin Village development.

Foul Drainage

As part of the new development the existing 300mm sewer will be diverted as necessary to correspond with the proposed road network of the new development and retain its connection point to network on the Courtown Road.

All foul effluent generated from the proposed development shall be collected in pipes of 150mm and 225mm diameter and flow under gravity into the diverted 300mm diameter uPVC sewer via new connections. The drainage network for the development shall be in accordance with Part H of the Building Regulations and to the requirements and specifications of Irish Water.

Water Supply

It is proposed to make a new connection off the existing 150mm diameter public watermains on Clonattin Village to the development site and supply a 100mm and 150mm internal diameter watermain to the proposed development site.

Gas

At this time, there is no provision for Mains Gas Supply to this development.

Power and Telecommunications

The proposed development will require the provision of 6 No. Unit-Substations, supplied in a Ring formation throughout the site to supply Residential and a Future Creche Facility. In addition, and in consultation with the Local ESB Regional Office, provision of sufficient capacity is also included for a future School (as indicated on associated plans) The load associated with the planned scheme will require a full new electrical infrastructure on site and while the apartments and homes will be highly energy efficient in terms on internal power demand, lighting and general services there will be a specific capacity provision for electric cars. The suburban location of the site puts it within a relatively short distance of work / leisure and retail destinations.

12.5 POTENTIAL IMPACTS

Construction Phase

Surface Water Drainage

The proposed surface water arrangement and proposed design takes into consideration the best practices for this type of development. As such the avoidance, remedial and mitigation measures, where required are minimum and will conform to the industry norm for such works.

Foul Drainage

The proposed wastewater system has been designed to Irish Water standards and prior to any construction work commencing on site the proposed wastewater design will be required to be vetted and approved by Irish Water. This requirement will ensure that any adverse effects which maybe experienced during the construction works.

Water Supply

The potable water system has been designed to Irish Water standards and prior to any construction work commencing on site the proposed water main design will be required to be vetted and approved by Irish Water. This requirement will ensure that any adverse effects which maybe experienced during or following completed can be mitigated against.

Power and Telecommunications

- The installation of the utilities for the development will be conducted in parallel with the other services. This will mainly involve construction of ducting and chambers using trench excavation. The potential adverse impact on the local public water supply network would be short term and imperceptible.

- The scheme will be ducted for two telco providers and applications will be made to both virgin and Eir to service the site. A robust broadband infrastructure is a priority for the scheme. Potential loss of connection

to the Telecommunications infrastructure while carrying out works to provide service connections. This likely adverse impact may be characterised as a temporary impact.

- The site compound will require a power and telecommunications connection. This likely adverse impact will be negligible.

Operational Phase

Surface Water Drainage

The potential effects on the proposed alterations will not have any adverse potential effects on the local surface water regime. The new storm water drainage system will tie into the existing attenuation pond that has been sized to accommodate this application, the flow restrictor currently in place will remain and the new development will not lead to additional adverse downstream conditions.

Foul Drainage

The proposed development will give rise to increased demand for wastewater services. The subject lands have been zoned for the proposed usage and as such the current zoning would have taken into consideration the predicated effluent volume generated on site for the proposed development.

Upgrade works maybe required to facilitate the development, but these upgrade works shall be confirmed at the connection agreement stage by Irish Water. All upgrade works shall be carried out by Irish water and costs associated will form part of the connection agreement.

Water Supply

The proposed development gives rise to an increased demand for water. The subject lands have been zoned for the proposed usage and as such the current zoning would have taken into consideration the predicated volume of potable water required for the proposed development.

Upgrade works maybe required to facilitate the development, but these upgrade works shall be confirmed at the connection agreement stage by Irish Water. All upgrade works shall be carried out by Irish water and costs associated will form part of the connection agreement.

Power and Telecommunications

- In terms of power the ESB will assess the network resilience in the area and request the installation of additional substations on site to meet the operation load envisaged for the site. It is our experience that the ESB will also use the scheme development to strengthen the general local network. The impact of the operational phase of the proposed development on the telecommunications network would be to increase the demand on the existing network.

12.6 POTENTIAL CUMULATIVE IMPACTS

There are no predicted cumulative impacts arising from the construction or operational phase when considered with other developments.

12.7 MITIGATION MEASURES

Construction Phase

As noted, the potable water and foul drainage system has been designed to Irish Water standards and prior to any construction work commencing on site the proposed water main design will be required to be vetted and approved by Irish Water. This requirement will ensure that any adverse effects which maybe experienced during or following completed can be mitigated against.

The proposed surface water arrangement and proposed design takes into consideration the best practices for this type of development. As such the avoidance, remedial and mitigation measures, where required are minimum and will conform to the industry norm for such works.

Where possible backup network supply to any services will be provided should the need for relocation or diversion or existing services be required otherwise relocation or diversion works will be planned to incur minimal impact, with users notified in advance of any works.

Connections to the existing telecommunications networks will be coordinated with the relevant utility provider and carried out by approved contractors.

Operational Phase

As the proposed completed development will offered for taking in charge to Wexford County Council monitoring of the development site will be the responsibility of the local authority to carry out any maintenance works required. Until such time as the development is taking in charge the developer will be responsibly of monitoring/maintenance the development site.

On completion of the construction phase no further mitigation measures are proposed in relation to the electrical and telecommunications infrastructure.

12.8 PREDICTED IMPACTS

Construction Phase

Waste materials will be generated during the construction of the proposed development, including the initial site clearance and excavation. Careful management of these, including segregation at source, will help to ensure maximum recycling, reuse and recovery is achieved. It is expected, however, that a certain amount of waste will still need to be disposed of at landfill.

Implementation of the measures outlined in Section 12.7 will ensure that the potential impacts of the proposed development on the site's material assets do not occur during the construction phase and that any impacts will be short term.

Operational Phase

The likely effect on the storm water system post development will ensure that no unattenuated storm water flows leave the subject lands. This will aid in preventing the potential for off site flooding downstream.

The likely effects for the local wastewater system, is the reduction in spare capacity in the local system. However, the subject lands have been designed to follow the planning objectives for the subject lands. Upgrade works maybe required to facilitate the development, but these upgrade works shall be confirmed at the connection agreement stage by Irish Water. All upgrade works shall be carried out by Irish water and costs associated will form part of the connection agreement.

The likely effects for the local water supply system, is the reduction in spare capacity in the local water supply system. However, the subject lands have been designed to follow the planning objectives for the subject lands. Upgrade works maybe required to facilitate the development, but these upgrade works shall be confirmed at the connection agreement stage by Irish Water. All upgrade works shall be carried out by Irish water and costs associated will form part of the connection agreement.

The demand on the power supply and telecommunications supply will all increase due to the development of the lands. These demands will be assessed and factored into the new site infrastructure called up by the utility providers.

12.9 'DO NOTHING' SCENARIO

There are no predicted impacts on these material assets should the proposed development not proceed.

12.10 WORST CASE SCENARIO

In the unlikely event a blockage or damage to pipe or watermain occurs, excess water and flood water may over spill onto the local road network. A flood exceedance route has been designed into the road network to ensure any excess flood water flows and ponds away from the residential units to green landscaped areas.

12.11 MONITORING & REINSTATEMENT

During construction all monitoring works will be carried out by the main contractor and post completion the developments maintenance staff will be charged with monitoring the drainage services.

In regard to reinstatement all foul drainage and water supply connection works required outside the red line are to be completed by Irish Water as per their connection agreement. Irish Water are therefore responsible for any connection and reinstatement works of site. All surface water works are contained within the red line boundary and as such no reinstatement works are required.

12.12 DIFFICULTIES IN COMPILING INFORMATION

No difficulties were encountered in compiling the information for this EIAR chapter.

12.13 REFERENCES

The following documents were reviewed in the preparation of this chapter:

- Irish Water Code of Practice For Water Infrastructure
- Irish Water Code of Practice For Waste Water Infrastructure
- Greater Dublin Strategic drainage Study.

13 WASTE MANAGEMENT

13.1 INTRODUCTION

This section addresses the subject of waste management for the proposed residential scheme at Clonattin, Gorey, Co. Wexford. Waste management is addressed for the construction and operational phases of the project.

A Construction and Demolition Waste Management Plan (CDWMP) has been prepared for the construction phase of the development in advance of the commencement of the construction works. A separate Operational Waste & Recycling Management Plan (OWRMP) has also been prepared for the operational phase of the development.

The C&D WMP has been prepared in accordance with the *'Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects'* document produced by the National Construction and Demolition Waste Council (NCDWC) in conjunction with the Department of the Environment, Heritage and Local Government in July 2006.

These documents will ensure the sustainable management of wastes arising at the development in accordance with legislative requirements and best practice standards.

Proposed Development Site Location and Brief Description

The proposed development is for a residential development of 363 units with a creche, as described in Chapter 3 of this EIAR and in the statutory notices.

Statement of Competence

In accordance with Article 5(3)(a) of the EU Directive, by appointing Traynor Environmental, the applicant has ensured that this chapter has been prepared by "Competent experts".

13.2METHODOLOGY

The assessment of the impacts of the proposed development arising from the consumption of resources and the generation of waste materials, was carried out taking into account the methodology specified in relevant guidance documents, along with an extensive document review to assist in identifying current and future requirements for waste management including national and regional waste policy, waste strategies, management plans, legislative requirements and relevant reports.

The primary legislative instruments that govern waste management in Ireland and applicable to the project are:

- Waste Management Act 1996 (No. 10 of 1996) as amended. Sub-ordinate legislation includes:
  - European Communities (Waste Directive) Regulations 2011 (SI 126 of 2011) as amended
  - Waste Management (Collection Permit) Regulations (S.I No. 820 of 2007) as amended
  - Waste Management (Facility Permit and Registration) Regulations 2007, (S.I No. 821 of 2007) as amended
  - Waste Management (Licensing) Regulations 2004 (S.I. No. 395 of 2004) as amended
  - Waste Management (Packaging) Regulations 2014 (S.I. 282 of 2014) as amended
  - Waste Management (Planning) Regulations 1997 (S.I. No. 137 of 1997)
  - Waste Management (Landfill Levy) Regulations 2015 (S.I. No. 189 of 2015)
  - European Union (Waste Electrical and Electronic Equipment) Regulations 2014 (S.I. No. 149 of 2014)
  - European Union (Batteries and Accumulators) Regulations 2014(S.I. No. 283 of 2014) as amended
  - Waste Management (Food Waste) Regulations 2009 (S.I. 508 of 2009), as amended
  - European Union (Household Food Waste and Bio-waste) Regulation 2015 (S.I. No. 191 of2015)
  - Waste Management (Hazardous Waste) Regulations, 1998 (S.I. No. 163 of 1998) as amended
  - Waste Management (Shipments of Waste) Regulations, 2007 (S.I. No. 419 of 2007) as amended
  - Waste Management (Movement of Hazardous Waste) Regulations, 1998 (S.I. No. 147 of 1998)
  - European Communities (Transfrontier Shipment of Waste) Regulations 1994 (SI 121 of 1994)
  - European Union (Properties of Waste which Render it Hazardous) Regulations 2015 (S.I. No. 233 of 2015)
- Environmental Protection Act 1992 (No. 7 of 1992) as amended.
- Litter Pollution Act 1997 (No. 12 of 1997) as amended.
- Planning and Development Act 2000 (No. 30 of 2000) as amended.

This Chapter is based on the proposed development and considers the following aspects:

- Legislative context.
- Construction phase (including site preparation, excavation and levelling); and,
- Operational phase.

A desk study was carried out which included the following:

- Review of applicable policy and legislation which creates the legal framework for resource and waste management in Ireland.
- Description of the typical waste materials that will be generated during the construction and operational phases; and
- Identification of mitigation measures to prevent waste generation and promote management of waste in accordance with the waste hierarchy.

Estimates of waste generation during the construction and operational phases of the proposed development have been calculated. The waste types and estimated quantities are based on published data by the EPA in *National Waste Reports*, data recorded from similar previous developments, Irish and US EPA waste generation research, other available research sources and waste collection data from the current facilities on site.

Mitigation measures are proposed to minimise the effect of the proposed development on the environment during the construction and operational phases, to promote efficient waste segregation and to reduce the quantity of waste requiring disposal.

Legislation and Guidance

Waste management in Ireland is subject to EU, national and regional waste legislation which defines how waste materials must be managed, transported and treated. The overarching EU legislation is the Waste Framework Directive (2008/98/EC) which is transposed into national legislation in Ireland. The cornerstone of Irish waste legislation is the Waste Management Act 1996 (as amended).

In addition, the Irish government issues policy documents which outline measures aimed to improve waste management practices in Ireland and help the country to achieve EU targets in respect of recycling and disposal of waste. The most recent policy document *A Resource Opportunity – Waste Management Policy in Ireland* was published in 2012 and stresses the environmental and economic benefits of better waste management, particularly in relation to waste prevention.

The strategy for the management of waste from the construction and demolition phase is in line with the requirements of the *Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects* published in 2006. The guidance document *Construction and Demolition Waste Management: A handbook for Contractors and Site Managers* was also consulted in the preparation of this assessment.

There are currently no Irish guidelines on the assessment of operational waste generation and guidance is taken from industry guidelines, plans and reports, British Standards and other relevant studies and reports including BS 5906:2005 Waste Management in Buildings – Code of Practice, the Southern Region Waste Management Plan 2015 – 2021, the EPA National Waste Database Reports 1998 – 2012 and the EPA National Waste Statistics Web Resource.

13.3 RECEIVING ENVIRONMENT

The subject site is located at Clonattin, Gorey, Co. Wexford. In terms of waste management, the receiving environment is largely defined by Wexford County Council as the local authority responsible for setting and administering waste management activities in the area. This is governed by the requirements set out in the *Southern Region Waste Management Plan 2015-2021.*

The waste management plan sets the following targets for waste management in the region:

- A 1% reduction per annum in the quantity of household waste generated per capita over the period of the plan.
- Achieve a recycling rate of 50% of managed municipal waste by 2020; and
- Reduce to 0% the direct disposal of unprocessed residual municipal waste to landfill (from 2016 onwards) in favour of higher value pre-treatment processes and indigenous recovery practices.

The Regional Plan sets out the strategic targets for waste management in the region and sets a specific target for C&D waste of *"70% preparing for reuse, recycling and other recovery of construction and demolition waste"* (excluding natural soils and stones and hazardous wastes) to be achieved by 2020.

The 2020 National Waste Statistics, which is the most recent study published, reported the following key statistics for 2017:

- Generated – Ireland produced 2.8million tonnes of municipal waste in 2017. This amounted to 577 kg of municipal waste per person. This represents a slight decrease on 2016 (581 kg per person), Ireland consistently ranks in the top tier of municipal waste producers in Europe and well above the EU average of 487 kg per person.
- Managed – Waste collected and treated by the waste industry. Over three quarters (77%) of Ireland's municipal waste was recycled or recovered in 2017, while less than one-quarter (23%) was landfilled.
- Unmanaged –Waste that is not collected or brought to a waste facility and is therefore likely to cause pollution in the environment because it is burned, buried or dumped. The EPA estimates that 44,501 t was unmanaged in 2017 compared to 44,868 in 2016.
- Recovered – the amount of waste recycled, used as a fuel in incinerators, or used to cover landfilled waste. In 2017, almost three quarters (74%) of municipal waste was recovered, this is a decrease from 79% in 2014
- Plastic Packaging: Ireland recycled 34% of waste plastic packaging in 2017, exceeding the Packaging Directive target of 22.5%. However, the revised Packaging Directive sets significantly more ambitious plastic packaging recycling targets of 50% for 2025 and 55% for 2030

Wexford County Council no longer operates any municipal waste landfill in the area. There are numerous wastes permitted and licensed facilities located in the Southern Waste Region for management of waste from the construction industry as well as municipal sources. These include soil recovery facilities, inert C&D waste facilities, hazardous waste treatment facilities, municipal waste landfills, material recovery facilities, waste transfer stations and two waste-to-energy facilities.

Demolition Phase

The demolition of a dwelling and associated shed on site is required as part of the proposed developments (c.334.27 sq.m).

The BRE Waste Benchmark Data as of June 2012 provides guidance on the demolition waste estimates based on the gross internal floor area of a building and the type of building. Estimated demolition quantities are given below. The contractor should prepare a more detailed estimate on possession of the site.

The building is defined as 'Residential'. The BRE Document gives the following average waste quantities per 100sqm of gross floor area as follows:

- Residential 16.8 tonnes/ 100sqm

Based on this total tonnage of waste generated by the residential building and foundations, waste is calculated as follows:

- Building to be demolished: [334.27m^2 / 100m^2] x 16.8 tonnes = 56.2 tonnes

The demolition waste breakdown of the project is detailed in Table 13.1 below:

	Waste Type	%	Taylors Lane (Tonnes)
1	Concrete, Bricks, Tiles, Ceramic *	64	36
2	Timber	13	7.3
3	Slate	8	4.5
4	Asphalt, Tar and Tar products	6	3.4
5	Plasterboard	4	2.2
6	Glass	3	1.7
7	Metals *	2	1.1
	Total Waste	**100%**	**56.2 Tonnes**

Table 13-1 Breakdown of Demolition Waste.

Construction Phase

During the construction phase, waste will be produced from surplus materials such as broken or off-cuts of timber, plasterboard, concrete, tiles, bricks, etc. Waste from packaging (cardboard, plastic, timber) and oversupply of materials may also be generated. The construction contractor will be required to ensure that oversupply of materials is kept to a minimum and opportunities for reuse of suitable materials is maximised.

In addition, there will be topsoil and subsoil excavated to facilitate construction of the new building's foundations, installation of services and site levelling. The project engineers, CSC Consulting Group, have estimated that the total volume of material to be excavated will be c. 69,473 m^3. It is expected a fill quantity of 69,551m^3 will be required. It will be expected that approximately 188m^3 of excavated material will be required to be removed off site.

In order to establish the appropriate reuse, recovery and/or disposal route for the material to be removed off-site, it will first need to be classified. Waste material will initially need to be classified as hazardous or non-hazardous in accordance with the EPA publication *Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous*. Environmental soil analysis will be carried out prior to construction on a number of the soil samples in accordance with the requirements for acceptance of waste at landfills (Council Decision 2003/33/EC Waste Acceptance Criteria). This legislation sets limit values on landfills for acceptance of waste material based on properties of the waste including potential pollutant concentrations and leachability.

In the unlikely event that surplus soils/stones are generated it may be suitable for acceptance at either inert or non-hazardous soil recovery facilities/landfills in Ireland, In the event of hazardous material being encountered, it will be transported for treatment/recovery or exported abroad for disposal in suitable facilities.
Waste will be generated from construction workers e.g. organic/food waste, dry mixed recyclables (waste paper, newspaper, plastic bottles, packaging, aluminium cans, tins and Tetra Pak cartons), mixed non-recyclables and potentially sewage sludge from temporary welfare facilities provided onsite during the construction phase. Waste printer/toner cartridges, waste electrical and electronic equipment (WEEE) and waste batteries may also be generated infrequently from site offices.

Further detail on the waste materials likely to be generated during the excavation and construction works are presented in the C&DWMP. The C&DWMP provides an estimate of the main waste types likely to be generated during the construction phase of the proposed development and these are summarised in Table 13.2.

Waste Types	Tonnes	Reuse		Recycle/Recover		Disposal	
		%	Tonnes	%	Tonnes	%	Tonnes
Mixed C&D	604.73	10	60.47	80	483.78	10	60.47
Timber	513.10	40	205.24	55	282.21	5	25.66
Plasterboard	183.25	30	54.98	60	109.95	10	18.32
Metals	146.61	5	7.33	90	131.94	5	7.33
Concrete	109.95	30	32.98	65	71.467	5	5.49
Other	274.87	20	54.97	60	164.93	20	54.97
Total	**1832.48**		**415.97**		**1,244.27**		**172.24**

Table 13-2 Estimated on and off-site reuse, recycle and disposal rates for construction waste

It should be noted that until final materials and detailed construction methodologies have been confirmed it is difficult to predict with a high level of accuracy the construction waste that will be generated. The exact materials and quantities may be subject to some degree of change and variation during the construction process. The site-specific C&DWMP will be updated and submitted prior to commencement of the construction phase which may refine the above waste estimates.

Operational Phase

An Operational Waste & Recycling Management Plan (OWRMP) has been prepared for the development. The plan will seek to ensure the development contributes to the targets outlined in the Southern Waste Region (SWR) Waste Management Plan 2015 – 2021. Mitigation measures proposed to manage impacts arising from wastes generated during the operation of the proposed development are summarised below.
All waste materials will be segregated into appropriate categories and will be stored in appropriate bins or other suitable receptacles in a designated, easily accessible areas of the site in accordance with the *Wexford County Development Plan 2013 – 2019.*

Waste Volume (L/week)					
Waste type	**3 Bed House**	**4 Bed House**	**5 Bed House**	**Maisonette (20 no. units)**	**Totals (L)**
Organic Waste	670	620	20	100	**1,410**
Mixed Dry Recyclables	16,080	19,220	760	1,350	**37,410**
Glass	670	620	20	100	**1,410**
Mixed Municipal Waste	16,080	19,220	760	1,350	**37,410**
Total	**33,500**	**39,680**	**1,560**	**2,900**	**77,640**

Table 13-3 Residential Waste Prediction (m^3/per week)

Waste Volume (L/week)				
Waste type	**Apartment Block 1 (54 no. units)**	**Apartment Block 2 (12 no. units)**	**Apartment Block 3 (15 no. units)**	**Totals (L)**
Organic Waste	270	60	75	**405**
Mixed Dry Recyclables	3645	1090	1135	**5,870**
Glass	270	60	75	**405**
Mixed Municipal Waste	3645	1090	1135	**5,870**
Total	**7,830**	**2,300**	**2,420**	**12,550**

Table 13-4 Residential Waste Prediction (m^3/per week)

Waste Volume (L/week)							
Non-Residential Floor Areas	**Area (sq.)**	**Area (NIA)**	**MDR**	**Food Waste**	**Residual Waste**	**Glass**	**Total (L)**
Crèche	513	395.01	1975.05	-	1975.05	-	**3950.1**
Total	513	395.01	1975.05	-	1975.05	-	**3950.1**

Table 13-5 Crèche Waste Predictions (L/per week)

All waste leaving the site will be recycled or recovered, with the exception of those waste streams where appropriate recycling/recovery facilities are currently not available. All waste leaving the site will be transported by suitable permitted contractors and taken to suitably permitted or licenced facilities. All waste leaving the site will be recorded and copies of relevant documentation maintained.

Hazardous Waste

Hazardous waste may be generated from WEEE, batteries, fluorescent tubes, and cleaning products. Any waste classed as hazardous will be required to be taken to a specialise waste company e.g. Rilta.

13.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed development is for a residential development as described in Chapter 3 of this EIAR and in the statutory notices.

The project will involve a construction period of 18-24 months. When considering a development of this nature, the potential waste management impact on the surroundings must be considered for each of three distinct stages:

- Demolition
- Construction Phase;
- Operational Phase.

As stated, the demolition phase will include the removal of the two existing buildings on site. The construction phase will involve extensive excavation and reprofiling over the development site and the erection of a new development and associated communal facilities over a phased construction period. These issues are discussed in detail in the following sections. Waste activities relating to the construction and operation of the development in terms of waste management are discussed.

13.5 POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

This section details the potential waste impacts associated with the proposed development.

Demolition and Construction Phase

The proposed development will generate a range of non-hazardous and hazardous waste materials during demolition and construction. General housekeeping and packaging will also generate waste materials as well as typical municipal wastes generated by construction employees including food waste.

Waste materials will be required to be temporarily stored on site pending collection by a waste contractor. Dedicated areas for waste skips and bins will need to be identified across the site. These areas will need to be easily accessible to waste collection vehicles.

If waste material is not managed and stored correctly, it is likely to lead to litter or pollution issues at the development and on adjacent developments. The knock-on effect of litter issues is the presence of vermin within the development and the surrounding areas.

The use of non-permitted waste contractors or unauthorised waste facilities could give rise to inappropriate management of waste and result in negative environmental impacts or pollution. It is essential that all waste materials are dealt with in accordance with regional and national legislation, as outlined previously, and that time and resources are dedicated to ensuring efficient waste management practices.

Wastes arising will need to be taken to suitably registered/permitted/licenced waste facilities for processing and segregation, reuse, recycling, recovery and/or disposal as appropriate. There are numerous licensed waste facilities in the Southern region which can accept hazardous and non-hazardous waste materials. Acceptance of waste from the proposed development would be in line with daily activities at these facilities. At present, there is sufficient capacity for the acceptance of the likely C&D waste arising at facilities in the region. Where possible, waste will be segregated into reusable, recyclable and recoverable materials. The majority of construction materials are either recyclable or recoverable.

Recovery and recycling of C&D waste has a positive impact on sustainable resource consumption, for example where waste timber is mulched into a landscaping product or waste asphalt is recycled for use in new pavements. The use of recycled materials, where suitable, reduces the consumption of natural resources.
There is a quantity of topsoil and sub soil which will need to be excavated to facilitate the proposed development. Correct classification and segregation of the excavated material is required to ensure that any potentially contaminated materials are identified and handled in a way that will not impact negatively on workers as well as on water and soil environments, both on and off-site.

The opportunities for waste materials to be reused off-site will provide positive impacts in the resourcing of materials for other developments and reduce the requirement for raw material extraction.

The potential effect of construction waste generated from the proposed development is considered to be ***short-term,*** and ***not significant.***

Operational Phase

The potential impacts on the environment of improper, or a lack of, waste management during the operational phase would be a diversion from the priorities of the waste hierarchy. This would lead to an increased volume of waste been disposed of site.

The nature of the development means the generation of waste materials during the operational phase is unavoidable. Networks of waste collection, treatment, recovery and disposal infrastructure are in place in the region to manage waste efficiently from this type of development. Waste which is not suitable for recycling is typically sent for energy recovery. There are also facilities in the region for segregation of municipal recyclables which is typically exported for conversion in recycled products (e.g. paper mills and glass recycling).

The waste materials generated on a daily basis will be stored in dedicated waste storage areas.

If waste material is not managed and stored correctly, it is likely to lead to litter or pollution issues at the development and on adjacent developments. The knock-on effect of litter issues is the presence of vermin within the development and the surrounding areas.

Waste collection vehicles will be required to service the development on a regular basis to remove waste. The use of non-permitted waste contractors or unauthorised facilities could give rise to inappropriate management of waste and result in negative environmental impacts or pollution. It is essential that all waste materials are dealt with in accordance with regional and national legislation, as outlined previously. Time and resources should be dedicated to ensuring efficient waste management practices. An Operational Waste & Recycling Management Plan has been submitted with the planning application.
The potential impact of operational waste generation from the development is considered to be ***long-term*** and ***not significant***.

13.6 POTENTIAL CUMULATIVE IMPACTS

The cumulative impact of the additional wastes generated by the proposed development has been considered. The existing waste management infrastructure and procedures for management of waste are sufficient and as such there will be no significant cumulative impact in terms of waste from the proposed development.

13.7 MITIGATION MEASURES

This section outlines the measures that will be employed in order to reduce the amount of waste produced, manage the wastes generated responsibly and handle the waste in such a manner as to minimise the effects on the environment.

Demolition and Construction Phase

A project specific C&D WMP has been prepared in line with the requirements of the guidance document issued by the DoEHLG. Adherence to the high-level strategy presented in this C&D WMP will ensure effective waste management and minimisation, reuse, recycling, recovery and disposal of waste material generated during the construction phase of the proposed development.

CS Consulting Engineers have estimated that 15,000m^3 of material will be generated from the excavations required to facilitate construction. Contractor(s) will endeavor to ensure material taken offsite is reused or recovered off-site or disposed of at authorised facility.

In addition, the following mitigation measures will be implemented:

- Building materials will be chosen with an aim to ‘design out waste’.
- On-site segregation of waste materials will be carried out to increase opportunities for off-site reuse, recycling and recovery – it is anticipated that the following waste types, at a minimum, will be segregated:
    - Concrete rubble (including ceramics, tiles and bricks).
    - Plasterboard.
    - Metals.
    - Glass; and
    - Timber.
- Left over materials (e.g. timber off-cuts, broken concrete blocks/bricks) and any suitable construction materials shall be re-used on-site, where possible.
- All waste materials will be stored in skips or other suitable receptacles in designated areas of the site.
- Any hazardous wastes generated (such as chemicals, solvents, glues, fuels, oils) will also be segregated and will be stored in appropriate receptacles (in suitably bunded areas, where required).
- A waste manager will be appointed by the main contractor(s) to ensure effective management of waste during the excavation and construction works.
- All construction staff will be provided with training regarding the waste management procedures.
- All waste leaving site will be reused, recycled or recovered where possible to avoid material designated for disposal.
- All waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licenced facilities; and
- All waste leaving the site will be recorded and copies of relevant documentation maintained.

These mitigation measures will ensure that the waste arising from the construction phase of the development is dealt with in compliance with the provisions of the *Waste Management Act 1996*, as amended, associated Regulations, the *Litter Pollution Act 1997* and the *SWR Waste Management Plan (2015 - 2021)*. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved and will encourage sustainable consumption of resources.

Operational Phase

All waste materials will be segregated into appropriate categories and will be stored in appropriate bins or other suitable receptacles in a designated, easily accessible areas of the site in accordance with the *Wexford County Development Plan 2013 – 2019.*
In addition, the following mitigation measures will be implemented:

- On-site segregation of all waste materials into appropriate categories including (but not limited to):
    - Organic/catering waste (including garden waste from landscaping activities).
    - Dry Mixed Recyclables.
    - Mixed Non-Recyclable Waste.
    - Glass.
- -Waste electrical and electronic equipment (WEEE) including computers, printers and other ICT equipment.
    - Batteries (non-hazardous and hazardous)
    - Fluorescent bulb tubes and other mercury containing waste (if arising).
    - Cleaning chemicals (pesticides, paints, adhesives, resins, detergents, etc.); and
- All waste materials will be stored in colour coded bins or other suitable receptacles in designated, easily accessible locations. Bins will be clearly identified with the approved waste type to ensure there is no cross contamination of waste materials.
- All waste collected from the development will be reused, recycled or recovered where possible, with the exception of those waste streams where appropriate facilities are currently not available.
- All waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licensed facilities; and
- These mitigation measures will ensure the waste arising from the development is dealt with in compliance with the provisions of the *Waste Management Act 1996*, as amended, and all associated Regulations. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved.

13.8 PREDICTED IMPACTS

The implementation of the mitigation measures outlined in Section 13.7 will ensure that a high rate of reuse, recovery and recycling is achieved at the development during the construction phases as well as during the operational phase. It will also ensure that European, National and Regional legislative waste requirements with regard to waste are met and that associated targets for the management of waste are achieved.

Construction Phase

A carefully planned approach to waste management as set out in Section 13.7 and adherence to the C&D WMP during the construction phase will ensure that the impact on the environment will be *short-term, neutral* and *imperceptible.*

Operational Phase

During the operational phase, a structured approach to waste management as set out in Section 13.7 will promote resource efficiency and waste minimisation. Provided the mitigation measures are implemented and a high rate of reuse, recycling and recovery is achieved, the predicted impact of the operational phase on the environment will be *long-term, neutral* and *imperceptible*.

13.9 'DO NOTHING' SCENARIO

If the proposed development did not go ahead there would be no waste generated at this site and operational waste generated from this site would stay at its current level.

13.10 WORST CASE SCENARIO

The 'worst-case' scenario, is that, should a C&D WMP not be implemented, the target recycling rates outlined in the Waste Management Plan for the Wexford Region and all relevant waste guidance targets will not be achieved. In addition, if waste is not managed and stored correctly on site, this may lead to litter or pollution issues on the site or adjacent sites. However, this is thought to be unlikely having taken into consideration the mitigation measures outlined above.

13.11 MONITORING & REINSTATEMENT

Construction Phase

The objective of setting targets for waste management is only achieved if the actual waste generation volumes are calculated and compared. This is particularly important during the construction phases where there is a potential for waste management to become secondary to progress and meeting construction schedule targets. The C&D WMP will specify the need for a waste manager to be appointed who will have responsibility to monitor the actual waste volumes being generated and to ensure that contractors and sub-contractors are segregating waste as required. Where targets are not being met, the waste manager should identify the reasons for targets not being achieved and work to resolve any issues. Recording of waste generation during the project will enable better management of waste contractor requirements and identify trends. The data should be maintained to advise on future projects.

Operational Phase

During the operational phase, waste generation volumes should be monitored against the predicted waste volumes outlined in the OWRMP. There may be opportunities to reduce the number of bins required in the communal Waste Storage Areas (WSAs) where estimates have been too conservative. Reductions in bin requirements will improve efficiency and reduce waste contractor costs. Waste legislation should also be consulted on a regular basis in case of any changes which may impact on waste management procedures.

13.12 DIFFICULTIES IN COMPILING INFORMATION

There were no difficulties encountered during the production of this chapter of the EIAR.

13.13 REFERENCES

- Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, August 2017).;
- Draft Advice Notes for preparing Environmental Impact Statements (EPA, September 2015).;
- Guidelines on Information to be contained in Environmental Impact Statements (EPA, 2002).;
- Advice Notes on Current Practice in the preparation of Environmental Impact Statements (EPA, 2003).;
- EPA National Waste (Database) Reports;
- *Wexford County Development Plan 2013 – 2019*;
- Waste Management Act 1996 (No. 10 of 1996), as amended.
- Southern Region Waste Management Plan 2015-2021.
- The Wexford County Council Household & Commercial Waste Bye-Laws 2018.
- Waste Framework Directive (Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste).
- Waste Management (Collection Permit) Regulations 2007 (S.I. No. 820 of 2007) as amended
- Waste Management (Facility Permit and Registration) Regulations 2007, as amended
- Waste Management: Changing Our Ways, The Department of the Environment and Local Government, 1998.
- Preventing and Recycling Waste: Delivering Change, The Department of the Environment and Local Government, 2002.
- Taking Stock & Moving Forward, The Department of the Environment and Local Government, 2004.
- National Strategy on Biodegradable Waste Management, Department Environment, Heritage and Local Government, 2006.
- A Resource Opportunity – Waste Management Policy in Ireland, Department of the Environment, Community and Local Government, 2012.
- Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous, Environmental Protection Agency, 2015.
- Waste Management in Buildings – Code of Practice, British Standard, BS 5906:2005, 2005.
- Mobile Waste and Recycling Containers Part 1: Containers with 2 wheels with a capacity up to
- 400 l for comb lifting devices — Dimensions and design, British Standard, BS EN 840-1:2012, 2012.
- Mobile waste containers. Containers with four wheels with a capacity from 750 l to 1700 l with flat lid(s), for wide trunnion or BG-and/or wide comb lifting devices. Dimensions and design, British Standard, BS EN 840-4:1997, 1997.
- Municipal Waste Statistics for Ireland, EPA Waste Data Release, 31 October 2018

14 CULTURAL HERITAGE AND ARCHAEOLOGY

14.1 INTRODUCTION

The following report details an archaeological assessment undertaken in advance of a proposed development at Clonattin Upper and Goreybridge, Gorey, County Wexford (Figure 14.1, ITM 716623/659674). This assessment has been carried out to ascertain the potential impact of the proposed development on the archaeological and cultural heritage resource that may exist within the area. The assessment was undertaken by Grace Corbett of IAC Archaeology Ltd, on behalf of Axis Construction Ltd.

This study determines, as far as reasonably possible from existing records, the nature of the archaeological and cultural heritage resource in and within the vicinity of the proposed development, using appropriate methods of study. Desk-based assessment is defined as a programme of study of the historic environment within a specified area or site that addresses agreed research and/or conservation objectives. It consists of an analysis of existing written, graphic, photographic, and electronic information in order to identify the likely heritage assets, their interests and significance and the character of the study area, including appropriate consideration of the settings of heritage assets (CIfA 2014). This leads to the following:

- Determining the presence of known archaeological, architectural and cultural heritage sites that may be affected by the proposed development;
- Assessment of the likelihood of finding previously unrecorded archaeological remains during the Construction Phase;
- Determining the impact upon the setting of known cultural heritage sites in the surrounding area; and
- Suggested mitigation measures based upon the results of the above research.

The study involved detailed interrogation of the archaeological and historical background of the proposed development area and its surrounding landscape. This included information from the Record of Monuments and Places of County Wexford, the County Development Plan, the topographical files of the National Museum of Ireland and cartographic and documentary records. A study area of 1km surrounding the proposed development area was used for the purposes of assessment. Inspection of the aerial photographic coverage held by the Ordnance Survey, Bing Maps and Google Earth has also been carried out. A field inspection has been carried out in an attempt to identify any known archaeological and cultural heritage sites and previously unrecorded features, structures and portable finds within the site.

An impact assessment and a mitigation strategy have been prepared. The impact assessment is undertaken to outline potential adverse impacts that the proposed development may have on the cultural heritage resource, while the mitigation strategy is designed to avoid, reduce or offset such adverse impacts.

14.2 METHODOLGY

The following legislation, standards and guidelines were consulted as part of this assessment.

- European Communities (EC) (Environmental Impact Assessment) (Amendment) Regulations 1999;
- National Monuments Acts 1930 (as amended);
- The Planning and Development Act 2000 (as amended);
- Heritage Act, 1995;
- Environmental Protection Agency (EPA) EPA Advice Notes on current practice in the preparation of Environmental Impact Statement (EIS) (EPA 2003) and draft revised notes (September 2015);
- EPA Guidelines on the Information to be contained in Environmental Impact Statement (EPA, 2002) and draft revised guidelines (August 2017);
- European Commission document 'Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report' (2017)
- Frameworks and Principles for the Protection of the Archaeological Heritage, 1999, (formerly) Department of Arts, Heritage, Gaeltacht and the Islands; and
- Local Government (Planning and Development) Act 2000.

Desk Based Assessment

The following sources were examined and a list of areas of archaeological and cultural heritage potential was compiled:

- Record of Monuments and Places for County Wexford;
- Sites and Monuments Record for County Wexford;
- Monuments in State Care Database;
- Preservation Orders;
- Register of Historic Monuments;
- Topographical files of the National Museum of Ireland;
- Cartographic and written sources relating to the study area;
- Wexford County Development Plan 2013–2019;
- Place name analysis;
- Aerial photographs; and
- Excavations Bulletin (1970-2019)

Record of Monuments and Places (RMP) is a list of archaeological sites known to the National Monuments Section, which are afforded legal protection under Section 12 of the 1994 National Monuments Act and are published as a record.

Sites and Monuments Record (SMR) holds documentary evidence and field inspections of all known archaeological sites and monuments. Some information is also held about archaeological sites and monuments whose precise location is not known e.g. only a site type and townland are recorded. These are known to the National Monuments Section as 'un-located sites' and cannot be afforded legal protection due to lack of locational information. As a result, these are omitted from the Record of Monuments and Places. SMR sites are also listed on the website created by the Department of Culture, Heritage and the Gaeltacht (DoCHG) – www.archaeology.ie.

National Monuments in State Care Database is a list of all the National Monuments in State guardianship or ownership. Each is assigned a National Monument number whether in guardianship or ownership and has a brief description of the remains of each Monument. The Minister for the DoCHG may acquire national monuments by agreement or by compulsory order. The state or local authority may assume guardianship of any national monument (other than dwellings). The owners of national monuments (other than dwellings) may also appoint the Minister or the local authority as guardian of that monument if the state or local authority agrees. Once the site is in ownership or guardianship of the state, it may not be interfered with without the written consent of the Minister.

Preservation Orders List contains information on Preservation Orders and/or Temporary Preservation Orders, which have been assigned to a site or sites. Sites deemed to be in danger of injury or destruction can be allocated Preservation Orders under the 1930 Act. Preservation Orders make any interference with the site illegal. Temporary Preservation Orders can be attached under the 1954 Act. These perform the same function as a Preservation Order but have a time limit of six months, after which the situation must be reviewed. Work may

only be undertaken on or in the vicinity of sites under Preservation Orders with the written consent, and at the discretion, of the Minister.

Register of Historic Monuments was established under Section 5 of the 1987 National Monuments Act, which requires the Minister to establish and maintain such a record. Historic monuments and archaeological areas present on the register are afforded statutory protection under the 1987 Act. The register also includes sites under Preservation Orders and Temporary Preservation Orders. All registered monuments are included in the Record of Monuments and Places.

The Topographical files of the National Museum of Ireland are the national archive of all known finds recorded by the National Museum. This archive relates primarily to artefacts but also includes references to monuments and unique records of previous excavations. The find spots of artefacts are important sources of information on the discovery of sites of archaeological significance.

Cartographic sources are important in tracing land use development within the development area as well as providing important topographical information on areas of archaeological potential and the development of buildings. Cartographic analysis of all relevant maps has been made to identify any topographical anomalies or structures that no longer remain within the landscape.

- Down Survey Map of the Parish of Liskin, Kilmaclogue, Kiltinen and part of Toome, c. 1655
- Ordnance Survey maps of County Wexford, 1839–40, 1936

Documentary sources were consulted to gain background information on the archaeological and cultural heritage landscape of the proposed development area.

Aerial photographic coverage is an important source of information regarding the precise location of sites and their extent. It also provides initial information on the terrain and its likely potential for archaeology. A number of sources were consulted including aerial photographs held by the Geological Survey of Ireland, the Ordnance Survey and Google Earth.

Place Names are an important part in understanding both the archaeology and history of an area. Place names can be used for generations and in some cases have been found to have their root deep in the historical past.

Development Plans contain a catalogue of all the Protected Structures and archaeological sites within the county. The Wexford County Development Plan 2013-2019 was consulted to obtain information on cultural heritage sites in and within the immediate vicinity of the proposed development. The Gorey Local Area Plan 2017-2023 was also consulted. The Record of Protected Structures lists structures of architectural, cultural, scientific, historical or archaeological interest can be protected under the Planning and Development Act, 2000, where the conditions relating to the protection of the architectural heritage are set out in Part IV of the Act. This Act superseded the Local Government (Planning and Development) Act, 1999, and came into force on 1st January 2000.

Excavations Bulletin is a summary publication that has been produced every year since 1970. This summarises every archaeological excavation that has taken place in Ireland during that year up until 2010 and since 1987 has been edited by Isabel Bennett. This information is vital when examining the archaeological content of any area, which may not have been recorded under the SMR and RMP files. This information is also available online (www.excavations.ie) from 1970–2019.

Field Inspection

Field inspection is necessary to determine the extent and nature of archaeological and cultural heritage remains, and can also lead to the identification of previously unrecorded or suspected sites and portable finds through topographical observation and local information.

The archaeological field inspection was conducted from 29 October 2019 and entailed:

- Walking the proposed development area and its immediate environs;
- Noting and recording the terrain type and land usage;
- Noting and recording the presence of features of archaeological, architectural, or cultural heritage significance:
- Verifying the extent and condition of recorded sites: and
- Visually investigating any suspect landscape anomalies to determine the possibility of their being anthropogenic in origin.

Archaeological Testing

Archaeological Test Trenching can be defined as '*a limited programme... of intrusive fieldwork which determines the presence or absence of archaeological features, structures, deposits, artefacts or ecofacts within a specified area or site on land or underwater. If such archaeological remains are present test trenching defines their character and extent and relative quality*' (CIfA 2014a, 4). A program of archaeological testing was carried out within the proposed development area in October 2020. This was undertaken by John O'Neill of IAC Archaeology under licence 20E0560 (O'Neill 2020, Figure 14.5). Detailed results of the archaeological testing are included in Section 14.4 and the full report is reproduced in Appendix 1 of this chapter.

Impact Assessment

For the purpose of this Impact Assessment, the impacts significance is defined in accordance with the EPA Guidelines on the Information to be Contained in Environmental Impact Statements (EPA, 2017).

- Negative Impact: A change which reduces the quality of the environment. For example: a change that will detract from or permanently remove an archaeological / architectural monument / structure from the landscape.
- Neutral Impact: No effects, or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
- Positive Impact: A change which improves the quality of the environment. For example: a change that improves or enhances the setting of an archaeological / architectural monument/structure.
- Direct Impact: Where an archaeological / architectural feature or site is physically located within the footprint of the proposed development and entails the removal of part, or all of the monument or feature.
- Indirect Impact: Where a feature or site of archaeological / architectural heritage merit or its setting is located in close proximity to the footprint of a potential route alignment.

It should be noted that whilst impact levels and definitions are applied consistently to the cultural heritage resource, direct impacts on sites that are subject to statutory protection are considered to be more significant than sites/ structures not subject to statutory protection.

Effect	Description
Imperceptible Effects	An effect capable of measurement but without noticeable consequences.
Slight Effects	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate Effects	An effect that alters the character of the environment in a manner that is consistent with existing and emerging trends.
Significant Effects	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
Very Significant Effects	An effect which, by its character, magnitude, duration or intensity significantly alters the majority of a sensitive aspect of the environment.
Profound Effects	An effect which obliterates sensitive characteristics.

Table 14-1 Impact definitions

14.3 RECEIVING ENVIRONMENT

The proposed development area is located in the townlands of Clonattin Upper and Goreybridge, Gorey, County Wexford. There are nine recorded monuments within 1km of the proposed development area, in addition to three sites listed in the SMR (Figure 14.1). The closest of these is a graveyard (WX007-034002), c. 174m northeast, containing the ruins of a Romanesque church (WX007-034001) and architectural fragments of that church (WX007-034003).

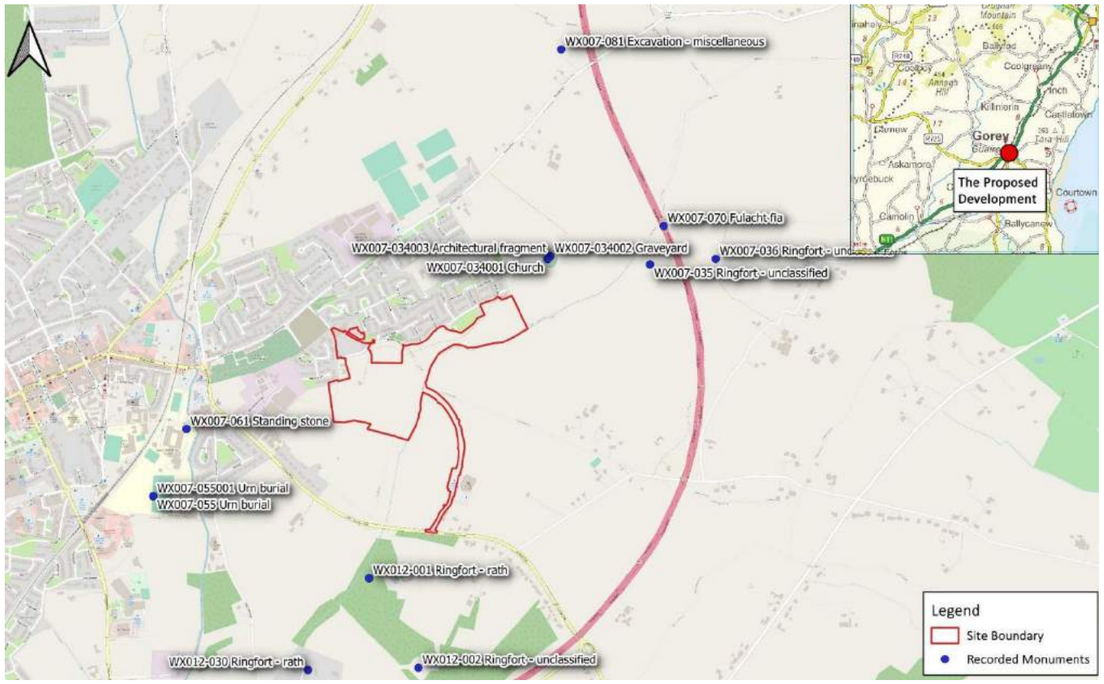

Figure 14-1 Proposed development area showing recorded monuments and archaeological sites

Archaeological and Historical Background

Prehistoric Periods (6000BC – 500AD)

Although recent discoveries may suggest a human presence in the southwest of Ireland as early as the Upper Palaeolithic (Dowd and Carden 2016), it is generally believed that the first colonisation of the island as a whole took place in the Mesolithic period. During this time, people fished, foraged and hunted to sustain themselves and appeared to live a transient lifestyle, migrating in order to exploit seasonal resources. As a result of this mobile lifestyle, little settlement evidence remains. Often the only evidence of Mesolithic activity is scatters of flint implements and the by-products of their manufacture. Occasionally, shell middens are found to date to this period. There is little evidence for the Mesolithic in County Wexford and no evidence in the vicinity of the proposed development area.

During the Neolithic period, agriculture was introduced and adopted as a way of life in Ireland. As a result, communities became less mobile as stock rearing and cereal cultivation became common. It was during this period that the megalithic tomb tradition emerged. There are four main types of megalithic tomb- court cairns, portal tombs, passage tombs and the wedge tombs of the early Bronze Age. However, there are no recorded Neolithic sites within the environs of the proposed development area.

The Bronze Age saw the production of metal for the first time. During this period the megalithic tomb tradition declined and ended in favour of a focus on the individual in burial. An urn burial (WX007-055/WX007-055001) was discovered c. 739m southwest of the proposed development area during quarrying in 1989. The cremation within the urn was confirmed to represent an adult female.

Another site type thought to reveal a glimpse of domestic life at this time is the burnt mound or fulacht fia. A common site within the archaeological record, they are commonly interpreted as temporary cooking sites but may have been used for other industrial or even recreational functions. These sites may have been used on a seasonal basis. They survive as low mounds of charcoal-enriched soil mixed with an abundance of heat-shattered stones. They are usually horseshoe-shaped and located in low-lying areas near a water source and are often found in clusters. Even when levelled by recent activity, such as ploughing, they are identifiable as burnt spreads in the landscape. A fulacht fia (WX007-070) was excavated (Licence No. E3493) in advance of the construction of the N11 Gorey to Arklow road scheme, c. 638m northeast of the proposed development area. This fulacht was located adjacent to a small stream which also flows directly to the southeast of the proposed development site.

Single upright standing stones are a common feature of the Irish landscape, and are known by various names such as gallán or leacht. They may date to different periods and serve different functions, but excavation has shown that some may mark pre-historic burials, while some may signify a route-way, a boundary, or serve a commemorative role. Generally speaking, it is likely that most date to the Bronze Age, apart from those that can be seen to be Ogham stones. The orientation of a stone may have had a significance, with their long axis aligned to another stone or toward a cairn on a mountain top, although the latter is difficult to prove. Occasionally standing stones are found which are all that remain of a formerly more complex megalithic monument. Some it must be said, could well have been erected in modern times as scratching posts for cattle. A standing stone (WX007-061) is recorded c. 556m west of the proposed development area. It is a small standing stone and does not appear on the historic mapping of the area.

Compared to the rest of Irish prehistory there is relatively little evidence in Ireland, as a whole, representing the Iron Age (500BC-AD400), though development-led archaeological investigations in recent decades has added to our knowledge of the Irish Iron Age. As in Europe, two phases of the Iron Age have been proposed in Ireland; the Hallstatt and the La Tène (Raftery 1994). While there is little evidence of the Hallstatt period in Ireland, La Tène influences are clearly identifiable in the metalwork of the period.

There are no recorded sites of Iron Age date in the vicinity of the proposed development area.

Early Medieval Period (AD500 – 1100)

The early medieval period is portrayed in the surviving literary sources as entirely rural, characterised by the basic territorial unit known as a túath (MacCotter 2008). These túaths were grouped into larger polities known as trícha cét, ruled over by local dynastic kings who were in turn ruled by provincial kings. Byrne (1973) estimates that there were probably at least 150 kings in Ireland at any given time. According to most recent estimates, each túath would have consisted of between 1,700 and 3,300 subjects, based on estimates placing the population of Ireland in the early medieval period as between a quarter and a half a million people (Stout 2017).

The lands around Gorey were ruled by the Uí Chennselaig sept of the Uí Dega (Culleton 1999, 32). The Uí Chennsailaig were a powerful branch of the Laigin. Ferns, c. 16km to the southwest of the Gorey, functioned as the seat of powers of successive Uí Chennselaig kings. During the 7th and 8th centuries, control of the wider area now known as Wexford was consolidated by Uí Chennselaig, which forced out the Uí Bairrche. Possession of Ferns came to mean the possession of power. From c. AD 769 the abbey there was elevated to the rank of royal monastery, replacing St. Mullin's in Carlow as the principal religious base in south Leinster.

From AD 795 onwards, Viking raids are recorded in the area now known as County Wexford. The county name itself derives from the Viking name for "the bay of the flats" – Waesfjords. Ferns, the focus of religious and political

power, was raided in AD 834 and again in AD 930, when the old monastery founded in the 6th century was plundered. However, the Vikings of Wexford soon came to accommodation with the Uí Chennselaig and were subsumed into the local and regional politics of the period.

During this period, enclosures known as ringforts were common throughout the country. These enclosed farmsteads were intimately connected to the division of land and the status of the occupant. A bóaire, for example, was a free farmer possessed of a plough team of oxen with household servants, workmen and dependants of various status, from free to unfree (MacCotter 2008). Ringforts are usually defined as a broadly circular enclosure delimited by an earthen bank and ditch (rath) or by a stone wall (cashel or caher). The space enclosed by the ditch or wall is known as the lios in early literature. It is likely that many of the single univallate ringforts relate to residences of bóaire. Larger, more prominently placed ringforts, with more than one enclosing wall or bank are likely to have been the residences of local kings (Stout 1997). Dating evidence from excavated ringforts suggests they were primarily built between the 7th and 9th centuries AD (ibid, 22–31). O'Sullivan et al suggest that there are 'at least 60,000 early medieval settlement enclosures on the island' (2014). A number of ringforts are recorded within 1km of the site. The closest of these (WX012-001) is located c. 300m south of the proposed development area. A further four ringforts are located c. 525m east (WX007-035), c. 762m east (WX007-036), c. 530m south (WX012-002) and c. 705m southwest (WX012-030) of the site.

Medieval Period (AD1100 – 1600)

The first of the Anglo-Norman landings took place in County Wexford, at the invitation of the former king of Leinster, Dermot MacMurrough. The Anglo-Normans, joined by 500 Uí Chennselaig men, took the Viking town of Wexford and the town of Ossory. Through a policy of military force and integration, the Anglo-Normans extended their control over large tracts of the country over the following century. Marriages between Norman leaders and the women of Ireland's great families aided this integration. The Norman feudal culture, techniques, language and legal systems were to have a profound effect on Wexford after 230 years of Norse influence.

In order to consolidate their hold upon these newly conquered territories, the Anglo-Norman grantees constructed motte and bailey castles on their holdings. While it is possible that many of these mottes may have endured in use into the 15th century (O'Conor 2002), a second phase of Anglo-Norman castle building followed from the late 12th century and saw the construction of more permanent stone-built structures.

Historic documents indicate that there may have been a small settlement at Gorey in the 13th century as a payment of 13 shillings was made by 'the community of the town (ville) of Gorey' in 1296 (SMR file). Evidence for medieval activity was also identified during excavations in 2007 in the town, when the remains of a small metal working site were identified (WX007-082).

The ruins of a Romanesque church (WX007-034001) is located within a graveyard (WX007-034002) c. 174m northeast of the proposed development area. The graveyard is delineated by an earthen bank and architectural fragments which once formed a Romanesque doorway are also recorded within the graveyard (WX007-034003). This church is thought to have been a cell of the monastery at Ferns (Gwynn and Hadcock 1970, 198).

Post-medieval Period (AD1600 – 1800)

Following the Gaelic Resurgence of the 14th and 15th centuries, the Tudor era saw a focused attempt to reconquer and pacify the entire country during the reigns of Henry VIII and Elizabeth I. The Elizabethan implementation of the 'Surrender and Regrant' policy allowed the monarch to continue colonising Ireland at a time when the treasury funds were too low to afford a war. The policy was to induce native leaders to put their lands under the protection and ultimate ownership of the crown. The implication was that if they did not, it would be taken away from them anyway. Under the Irish custom the clan itself owned the land, not any individual and this included the chief. He administered it during his lifetime but could not will any part of it on his death at which time it reverted to the charge of the tanaiste or appointed successor for the clan, not necessarily his son and heir.

The inducement was that on re-granting the chieftain would personally own the land and could will it in any way he desired, the aim of which was to break up the clan system and to put the lands and the owners within the control of the crown. However, the crown could take the land back at any time and this occurred frequently over the coming years. Confiscated lands were granted to 'undertakers' – suitable English people of the new faith who would undertake to purchase available land at a very low price on agreement that it would be sub-let exclusively to English Protestants.

In 1618, King James I gave directions that the Wexford Plantation was to have a plantation town. The result was the grant of a charter to Bishop Ram, Protestant Bishop of Ferns and Leighlin, in 1619, and the development of a town, initially called Newborough and later Gorey. The plantation of Wexford was the first colonial settlement undertaken by the Dublin government after the massive introduction of British settlers into Ulster at the beginning of the 17th century (Loeber & Stouthamer-Loeber, 1987). It was initiated in order to settle the northern part of the county, which had never been fully penetrated following the Anglo-Norman conquest of the 12th century and where the native Irish sept, the McMurrough Kavanaghs, retained a strong presence. Large tracts of land, ranging from 1000 to 3000 acres, belonging to families of both old Gaelic and Anglo-Norman stock were confiscated and colonial strong houses, subsequently destroyed in the rebellion of the 1640s, sprang up throughout the landscape.

Gorey was laid out on a grid pattern of c. 14 acres and was not thought to have been defended with a wall. The Main Street runs east–west through the centre of the original town area. The site of the parish church of Gorey town, within a rectangular enclosure, is located within Gorey Corporation Lands. No visible remains of the church survive.

Following the pacification of the county, the 17th and 18th centuries saw a dramatic rise in the establishment of large residential houses in Wexford. The large country house was only a small part of the overall estate of a large landowner and provided a base to manage often large areas of land that could be located nationwide. Lands associated with the large houses were generally turned over to formal gardens, which were much the style of continental Europe. This style of formal avenues and geometric gardens designs was gradually replaced during the mid-18th century by the adoption of parkland landscapes – to be able to view a large house within a natural setting. Although the creation of a parkland landscape involved working with nature, rather than against it, considerable constructional effort went into their creation. Earth was moved, field boundaries disappeared, streams were diverted to form lakes and quite often roads were completely diverted to avoid travelling anywhere near the main house or across the estate (McDonagh 2010). The former demesne of Clonatin House lies c. 37m north of the proposed development area, however this demesne has been significantly altered through the construction of a large housing estate across much of the area.

Summary of Previous Archaeological Investigations

A review of the Excavations Bulletin (1970–2019) has revealed that although a number of archaeological investigations have taken place in the environs of the proposed development area in Gorey, little of archaeological significance was been identified.

A fulacht fia (WX007-070) was excavated (Licence no. E3493) in advance of the construction of the N11 Gorey to Arklow road scheme, c. 638m northeast of the proposed development area. A single pit was also identified and excavated (Licence no. E3679) (WX007-081), c. 960m north-northeast of the proposed development area as part of the same scheme.

LICENCE REF.	LOCATION	DISTANCE TO SCHEME	REFERENCE
10D039; 10R110	River Banogue	Varies	Bennett 2010:768
99E0086	Mill Lands, Gorey	c. 345m west	Bennett 1999:881
05E0153	21–22 Esmonde Street Lower	c. 646m west	Bennett 2005:1644
08E0195	39 Esmonde Street	c. 702m west	Bennett 2008:1281

Table 14-2 Archaeological investigations which did not reveal archaeological remains

Cartographic Analysis

Down Survey Map of the Parish of Liskin, Kilmaclogue, Kiltinen and part of Toome, c. 1655

Gorey 'fort' and town are marked on this map, however there is little detail. A number of significant buildings are marked in the landscape, including what appear to be a church and a castle or tower. Large areas of the surrounding lands are annotated as unforfeited lands.

First Edition Ordnance Survey Map, 1839–40, scale 1:10,560 (Figure 14.2)

This is the first accurate historic mapping coverage of the area containing the proposed development area. The site is shown c. 37m south of demesne of Clonatin House, with the principal structures, parkland and gate lodges also depicted. The townland boundary between Clonattin Upper and Courteencurragh forms the southeastern boundary of the proposed development area and is consists of a small stream. The townland boundary between Goreybridge and Raheenagurren East forms the southwestern boundary of the proposed development area, while the townland boundary between Clonattin Upper and Goreybridge runs northwest-southeast through the proposed development area. Killmakilloge graveyard (WX007-034002) is depicted with the church (WX007-034001) annotated as in ruins by this time. A roman Catholic Chapel and graveyard are also depicted c. 404m west of the proposed development area.

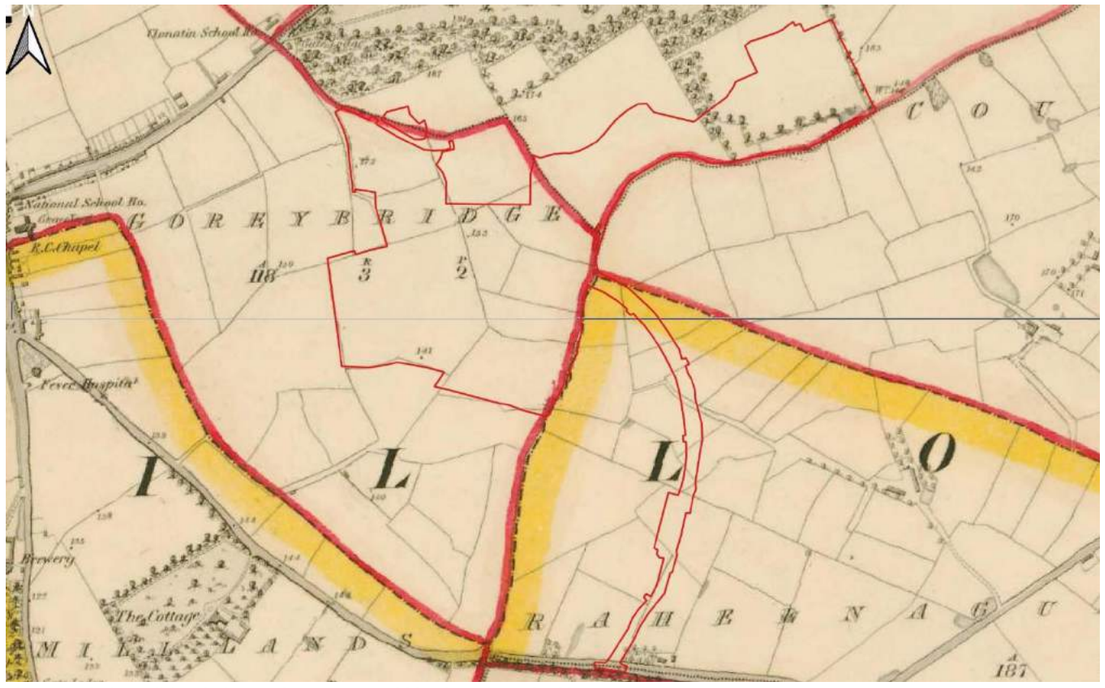

Figure 14-2 First Edition Ordnance Survey Map, 1839–40, scale 1:10,560

Ordnance Survey Map, 1936, scale 1:2,500 (Figure 14.3)

There is little change to the proposed development area at this time. Killmakilloge graveyard (WX007-034002) and associated church (WX007-034001) are still depicted. Clonatin House and demesne appears unchanged. The R.C. Chapel within St. Michael's Cemetery is no longer shown, with the graveyard having expanded eastwards.

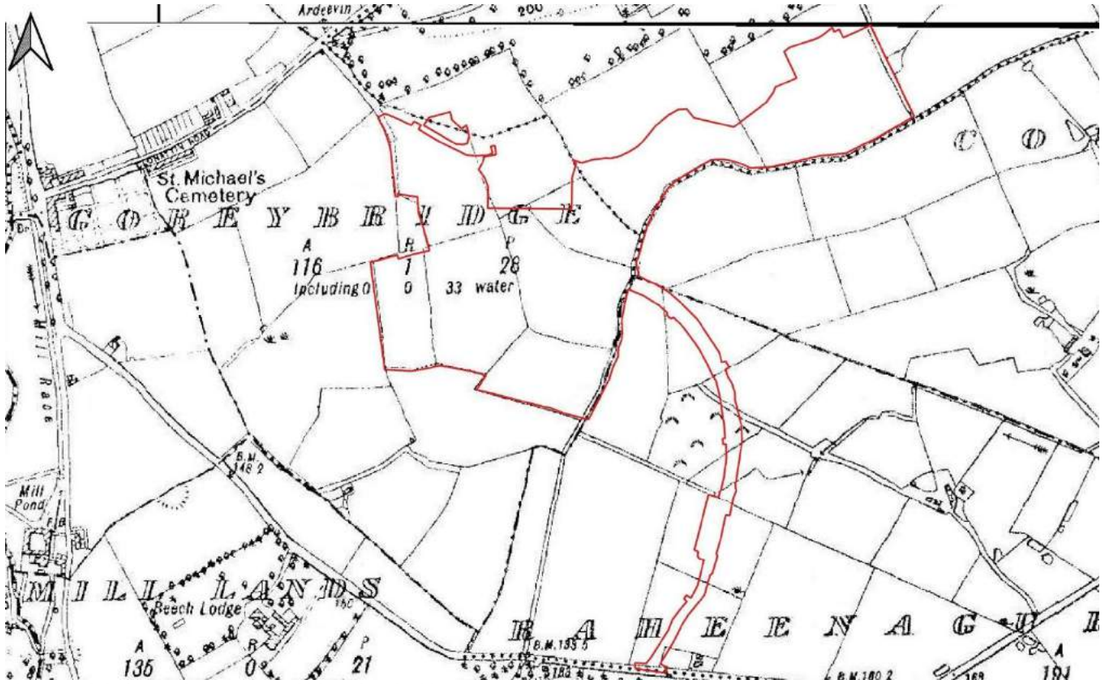

Figure 14-3 Ordnance Survey Map, 1936, scale 1:2,500

County Development Plan

The County Wexford Development Plan (2013–2019) recognises the statutory protection afforded to recorded monuments and to protected structures. The aims and objectives of the County Wexford Development Plan regarding archaeological heritage are listed in Appendix 3. There are nine recorded monuments within 1km of the proposed development area, in addition to three sites listed in the SMR. These are listed below in Table 3. Further information on these sites can be found in Appendix 14.1.

RMP NO.	LOCATION	CLASSIFICATION
WX007-034002	Clonattin Upper	Graveyard
WX007-034001	Clonattin Upper	Church
WX007-034003	Clonattin Upper	Architectural fragment
WX007-035	Courteencurragh	Ringfort - unclassified
WX012-001	Raheenagurren West	Ringfort - rath
WX007-061	Gorey Corporation Lands	Standing stone
WX007-070	Courteencurragh	Fulacht fia
WX007-055001	Gorey Corporation Lands	Urn burial
WX007-055	Gorey Corporation Lands	Urn burial
WX007-036	Courteencurragh	Ringfort - unclassified
WX012-002	Raheenagurren West	Ringfort - unclassified
WX012-030	Raheenagurren West	Ringfort - rath
WX007-081	Clonattin Lower	Excavation - miscellaneous

Table 14-3 Recorded Archaeological Sites

Aerial Photographic Analysis

Inspection of the aerial photographic coverage of the proposed development area held by the Ordnance Survey (1995, 2000, and 2005), Google Earth (2010–2018) and Bing Maps revealed that the northern half of the proposed development area has been disturbed by the construction of the adjacent housing development (Figure 14.4). No features of archaeological potential were identified from the aerial photography.

Figure 14-4 Previous disturbance shown on Ordnance Survey Ireland Imagery

Field Inspection

The field inspection sought to assess the site, its previous and current land use, the topography and any additional information relevant to the report. During the course of the field investigation the proposed development area and its surrounding environs were inspected.

The northern half of the proposed development area is occupied by scrubland which had been previously disturbed during the construction of Clonattin village housing estate, which borders the site to the north. This part of the site is largely overgrown, with areas of concrete and other debris, as well as large spoil heaps at the north eastern end of the site (Figure 14.5-7).

Figure 14-5 North eastern end of site, facing southwest

Figure 14-6 North eastern end of site, facing south

Figure 14-7 Northern end of site, facing west

Three fields at the southern end of the site do not appear to have been disturbed, although they are overgrown in places, with a reservoir located at the south eastern corner of the site (Plates 14.8 – 14.11). A modern 20th century house is also located within the site, at its western side, however this house is now derelict.

Figure 14-8 Centre of site, facing northeast

Figure 14-9 Southern end of site, facing south

Figure 14-10 South western end of site, facing west

Figure 14-11 Centre of site, facing south

The townland boundary between Clonattin Upper and Courteencurragh consists of a small stream, while that between Clonattin Upper and Goreybridge, which traverses the site, has been partially removed, with the remaining section consisting of a hedgerow.

No archaeological features were identified during the site inspection.

Cultural Heritage

The term 'cultural heritage' can be used as an over-arching term that can be applied to both archaeology and architectural heritage. However, it also refers to more ephemeral aspects of the environment, which are often recorded in folk law or tradition or possibly date to a more recent period. No specific cultural heritage sites have been identified during the course of this assessment that relate to the proposed development area, however the archaeological sites within the study area listed in Table 14.3 should also be considered as cultural heritage.

Placename Analysis

Townland and topographic names are an invaluable source of information on topography, land ownership and land use within the landscape. They also provide information on history; archaeological monuments and folklore of an area. A place name may refer to a long-forgotten site, and may indicate the possibility that the remains of certain sites may still survive below the ground surface. The Ordnance Survey surveyors wrote down townland names in the 1830's and 1840's, when the entire country was mapped for the first time. Some of the townland names in the study area are of Irish origin and through time have been anglicised. The main reference used for the place name analysis is Irish Local Names Explained by P.W Joyce (1870). A description and possible explanation of each townland name in the environs of the proposed route are provided in Table 14.4.

NAME	DERIVATION	POSSIBLE MEANING
Clonattin Upper	*Cluain Aitinn Uachtarach*	Meadow of gorse
Goreybridge	-	Gorey bridge
Raheenagurren East	*Ráithín na gCoirín Thoir*	The small ringfort of Coirín
Courteencurragh	*Cúiltín Curraigh*	Cúiltín's marsh

Table 14-4 Placename analysis

Townlands

The townland is an Irish land unit of considerable longevity as many of the units are likely to represent much earlier land divisions. However, the term townland was not used to denote a unit of land until the Civil Survey of 1654. It bears no relation to the modern word 'town' but like the Irish word baile refers to a place. It is possible that the word is derived from the Old English tun land and meant 'the land forming an estate or manor' (Culleton 1999, 174).

Gaelic land ownership required a clear definition of the territories held by each sept and a need for strong, permanent fences around their territories. It is possible that boundaries following ridge tops, streams or bog are more likely to be older in date than those composed of straight lines (ibid. 179).

The vast majority of townlands are referred to in the 17th century, when land documentation records begin. Many of the townlands are mapped within the Down Survey of the 1650s, so called as all measurements were carefully 'laid downe' on paper at a scale of forty perches to one inch. Therefore, most are in the context of pre-17th century landscape organisation (McErlean 1983, 315).

In the 19th century, some demesnes, deer parks or large farms were given townland status during the Ordnance Survey and some imprecise townland boundaries in areas such as bogs or lakes, were given more precise definition (ibid.). Larger tracks of land were divided into a number of townlands, and named Upper, Middle or Lower, as well as Beg and More (small and large) and north, east, south and west (Culleton 1999, 179). By the time the first Ordnance Survey had been completed a total of 62,000 townlands were recorded in Ireland.

Although not usually recorded as archaeological monuments in their own right, townland boundaries are important as cultural heritage features as they have indicated the extents of the smallest land division unit in the country—the townland—which have been mapped since the nineteenth century. It remains unclear how old these land units actually are, though it has been convincingly argued that they date to at least the medieval period and may be significantly older than this (McErlean 1983; MacCotter 2008).

The proposed development area is located within the townlands of Clonattin Upper and Goreybridge. The surrounding townlands in the study area consists of Raheenagurren East and Courteencurragh to the south. These townlands are located within the parish of Killmakilloge and the Baronies of Ballaghkeen North and Gorey, County Wexford.

The townland boundary between Clonattin Upper and Courteencurragh forms the southeastern boundary of the proposed development area and is a stream. The townland boundary between Goreybridge and Raheenagurren East forms the southwestern boundary of the proposed development area and the townland boundary between Clonattin Upper and Goreybridge runs northwest-southeast through the proposed development area.

Topographical Files

Information on artefact finds from the study area in County Wexford has been recorded by the National Museum of Ireland since the late 18th century. Location information relating to these finds is important in establishing prehistoric and historic activity in the study area.

A tanged iron blade (NMI Ref.: 2005:70) is recorded from c. 400m west of the proposed development area.

14.4 ARCHAEOLOGICAL TESTING

Test trenching took place on the 12th October 2020, using a 13 tonne 360 degree tracked excavator equipped with a flat, toothless bucket under strict archaeological supervision. Any investigated deposits were preserved by record. This was by means of written, drawn, and photographic records.

A total of 21 trenches were excavated across the site measuring c. 1,875 linear metres. Test trenches were laid out to excavate a sample portion of the site, across the various fields. As there were no surface features deemed to have potential archaeological significance, testing was only constrained by overhead power lines and underground surfaces.

Figure 14-12 Plan of excavated and unexcavated trenches

Test trenches proposed for an access road to the east of the proposed development were not excavated as the lands were not available for testing. At the time of testing the lands were under grass with patches of dense vegetation such as gorse, hawthorns and brambles. The northern boundaries of the area tested had seen some construction related activity in the early 2000s, during works associated with the construction of Clonattin Village, but had not been significantly modified. A reservoir constructed at the southeast corner of the proposed development area is connected via an access road and pipe trenches to Clonattin Village. The siting of test trenches took the location of works associated with their construction into account.

The test trenches were excavated to determine, as far as reasonably possible, the location, extent, date, character, condition, significance and quality of any surviving archaeological remains threatened by the proposed development. Test trenching was also carried out to clarify the nature and extent of existing disturbance and intrusions and to assess the degree of archaeological survival in order to formulate further mitigation strategies. These are designed to reduce or offset the impact of the proposed development scheme.

No areas of archaeological interest were noted during testing. Where material was present in the topsoil it generally took the form of nineteenth and twentieth century pottery, glass, brick and some iron objects, likely discarded on the fields to disperse household waste. Testing identified the topsoil across the site as a light brown silty clay. This varied in depth between 0.25 m in depth to 0.80 m. The latter height was present where the soil had been deliberately built up to form a bank (apparently during works associated with pipe-laying on the site in recent decades). In general, where there was variation within trenches the depth of soil increased from north-south as the area being tested tended to slope slightly towards the south.

The subsoil varied between areas of compact orange, grey-brown, grey and white clays with patches of solid iron panning and dense mineralisation. The relatively light hue of the topsoil and iron panning indicated podzolisation had occurred or begun to take place. It was notable that the subsoil was relatively uneven and included localised hollows and irregularities. Evidence for cultivation, such as plough marks, was minimal and the uneven surface of the subsoil suggested that the area tested had not been systematically ploughed in the past.

14.5 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed strategic housing development at this site in Clonattin, Gorey will include the demolition of the existing buildings and will provide 363 no. residential units, a creche, public open space, a new access road connecting to Courtown Road. All associated site development works and services provisions including parking, bin storage, substations, landscaping and all services required to facilitate the proposed development. A full description is provided in the statutory notices and in Chapter 3 of the EIAR.

14.6 POTENTIAL IMPACTS

Construction Phase

There are no known archaeological or cultural heritage sites located within the proposed development boundary, however, there remains potential for previously unknown archaeological deposits to survive below ground level across the southern end of the site. There may be an adverse impact on any such features or deposits. This will be caused by ground disturbances associated with the proposed development.

Operational Phase

There are no predicted impacts to any archaeological, architectural or cultural heritage assets during the operation of the proposed development.

14.7 POTENTIAL CUMULATIVE IMPACTS

A number of developments, both proposed and those granted permission, in the surrounding area have been considered in the assessment of cumulative impacts.

There are no predicted cumulative impacts to the archaeological or cultural heritage resource. Should any archaeological or cultural heritage remains be identified on the site, they will be preserved by record, mitigating any negative impacts and adding to the understanding of the historical development of this area. Where proposed and granted developments in the surrounding area have the potential to impact on archaeological remains, it is highly likely that mitigation measures have also been proposed to preserve by record any identified archaeological remains.

14.8 MITIGATION MEASURES

Construction Phase

It is recommended that the access road is subject to archaeological testing once the lands become available. Should any archaeological remains be identified in this area, further archaeological mitigation may be required, such as preservation in-situ or by record.

It is recommended that all ground disturbances associated with the proposed development be monitored by a suitably qualified archaeologist. If any features of archaeological potential are discovered during the course of the works further archaeological mitigation may be required, such as preservation in-situ or by record. Any further mitigation will require approval from the National Monuments Service of the DoCHG.

Operational Phase
Not applicable.

14.9 PREDICTED IMPACTS

Construction Phase
Following the implementation of the above mitigation measures, there would be no residual impacts on the archaeological, architectural or cultural heritage resource

Operational Phase
Not applicable.

14.10 'DO NOTHING' SCENARIO

If the proposed development were not to proceed there would be no negative impact on the archaeological or cultural heritage resource.

14.11 WORST CASE SCENARIO

In the event that the development proceeds without cultural heritage mitigation in place, it is possible that features of culture heritage value will be destroyed without proper record.

14.12 MONITORING & REINSTATEMENT

The mitigation measures recommended above would also function as a monitoring system to allow the further assessment of the scale of the predicted impacts and the effectiveness of the recommended mitigation measures.

14.13 DIFFICULTIES IN COMPILING INFORMATION

No difficulties were encountered during the course of this assessment

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CARTOGRAPHIC SOURCES

- Down Survey Map of the Parish of Liskin, Kilmaclogue, Kiltinen and part of Toome, c. 1655
- Ordnance Survey maps of County Wexford, 1839–40, 1936

ELECTRONIC SOURCES

- www.excavations.ie – Summary of archaeological excavation from 1970–2018.
- www.archaeology.ie – DoCHG website listing all SMR sites.
- www.osiemaps.ie – Ordnance Survey aerial photographs dating to 1995, 2000 and 2005 and 6-inch/25-inch OS maps.
- www.heritagemaps.ie – The Heritage Council web-based spatial data viewer which focuses on the built, cultural and natural heritage.
- www.googleearth.com – Satellite imagery of the proposed development area.
- www.booksulster.com/library/plnm/placenamesC.php - Contains the text from Irish Local Names Explained by P.W Joyce (1870).
- www.logainm.ie –Placenames Database of Ireland launched by Fiontar agus Scoil na Gaelige and the DoCHG.

15 INTERACTIONS

15.1 INTRODUCTION

As a requirement of the Planning and Development Regulations 2001, as amended, and the draft EPA guidelines (2017), not only are the individual significant impacts required to be considered when assessing the impact of a development on the environment, but so must the interrelationships between these factors be identified and assessed.

Under the Regulations interactions between the various environmental factors, are to be assessed as well as the vulnerability of the proposed development to the risk of natural disaster.

15.2 ASSESSMENT

Where an interaction is both likely and significant, it is given a reference number in the matrix and detail of the interaction is recorded below. The interactions are listed in numerical sequence, purely for referencing purposes.

	Population	Biodiversity	Soil	Hydrology	Noise	Air and Climate	Landscape	Traffic	Waste	Cultural Heritage	Material Assets
Population											
Biodiversity											
Soil	1	7									
Hydrology	2	8	11								
Noise	3	9									
Air and Climate	4		12								
Landscape	5	10	13								
Traffic											
Waste											
Cultural Heritage							14				
Material Assets	6										

Table 15-1 Interactions Matrix

1. Population & Human Health / Soils

There is potential for dust generation during construction works, which under dry and windy conditions could lead to localised dust impacts for the small number of properties proximate to the development site. However, the implementation of dust management and dust control measures will ensure that the proposed development will not give rise to the generation of any significant quantities of dust. Therefore, there will be minimal impacts on local residents.

2. Population & Human Health / Water

Failure or mismanagement of the potable water supply could lead to its contamination during the construction phase. A range of mitigation measures will be put in place during the construction phase of the development to ensure this does not occur.

3. Population & Human Health / Noise

Increased noise levels during the construction phase will be temporary and are not expected to have a long-term significant adverse effect upon the local population. Construction noise will be audible at a low level in the ambient noise. However, the impact is predicted to be minor. The impact due to the increased traffic associated with the operational development is expected to be minor.

4. Population & Human Health / Air

The completed development will generate additional emissions to the atmosphere due to traffic associated with the development. However, air quality in the vicinity of the site is expected to remain within air quality standards.

During construction, there may be potential for slight dust nuisance in the immediate vicinity of the site. However, dust control measures, such as wheel washes, covering of fine material etc. will minimise the impacts on air quality.

5. Population & Human Health / Landscape

Existing residents and visitors to the area interact with the landscape, such that they will be aware of a significant change at this site from a primarily greenfield site to a new residential development with a mix of unit types, building heights, open spaces etc. Such a transformation, whilst significant, is designated for this site in the Gorey Town and Environs Local Area Plan 2017-2023. It is expected that the design of the proposed scheme will over time integrate with the surrounding area.

6. Population & Human Health / Materials Assets

It is expected that the proposed development will benefit the materials assets with the additional population helping to sustain and generate improvements to the physical infrastructure of the area.

7. Biodiversity / Soils

Potential construction stage effects arising from the general loss and fragmentation of some habitats and reduction of associated opportunities for biodiversity are considered neutral to slight negative during the construction phase, while potential operational stage effects are considered imperceptible neutral as new planting/landscaping matures.

8. Biodiversity / Water

As concluded in the Appropriate Assessment Screening Report submitted with the application there are no elements of the proposed development that are likely to give rise to significant effects on Natura 2000 sites in the wider area.

The implementation of construction and operational phase soils and water management proposals, together with the site drainage design will adequately reduce such potential impacts arising from the development site on these aquatic habitats in the wider area. Potential construction and operational phase effects on biodiversity associated with aquatic habitats in the wider area are considered imperceptible/neutral with the implementation of soils and water management proposals.

9. Biodiversity / Noise

Increased noise levels during the construction phase will only be temporary and are not expected to have a long-term significant adverse effect upon remaining fauna within the wider landscape.

Operational noise will be audible at a low level in the ambient noise and the impact is predicted to be minor.

10. Biodiversity / Landscape

The changes to the landscape of the subject site has the potential to negatively impact the biodiversity in the immediate are, as outlined in Chapter 5.

The proposed landscape masterplan including the retention of trees where feasible will help to mitigate this loss of habitats and biodiversity in the area. New planting will provide new habitats for local species.

11. Soils / Water

When soil is exposed after vegetative clearance there will also be increased run-off and evaporation. Mitigation measures will be implemented during construction to prevent this run-off water from discharging directly to watercourses.

12. Soils / Air

Exposed soil during the construction phase of the proposed scheme may give rise to increased dust emissions. However, the implementation of dust management and dust control measures will ensure that the proposed development will not give rise to the generation of any significant quantities of dust.

13. Soils/Landscape

Residual soils arising as a result of excavation at the development site will be used in landscaping works in the proposed public open spaces as much as possible rather than transporting off-site.

14. Landscape/Cultural Heritage

Careful consideration has been given to minimizing the visual impact of the proposed scheme on architectural heritage in the wider area.

16 SUMMARY OF MITIGATION MEASURES

16.1 INTRODUCTION

Given the complexity of the proposed development and this EIAR, this chapter seeks to provide a complete summary of mitigation measures proposed in Chapters 4 to 16. The appointed contractor will be required to adhere to the mitigation contained in the EIAR. Monitoring of the effectiveness of mitigation measures put forward in the EIAR document by the competent authorities is also integral to the process.

16.2 CONSTRUCTION PHASE

Population and Human Health	A preliminary Construction and Environmental Management Plan (CEMP) has been prepared by the CS Consulting Engineers and will be implemented during the construction phase to reduce the detrimental effects of the construction phase on the environment and local population. The CEMP will be formally agreed in writing with the planning authority in writing prior to the commencement of the development (the preliminary CEMP is included with this application for reference). Other items to be mitigated during the construction phase are discussed further under various environmental topics discussed in the chapters following. These measures are put forward to avoid any significant negative environmental impacts on the population and human health.

Biodiversity	Standard construction and operational controls will be incorporated into the proposed development project to minimise the potential negative impacts on the ecology within the Zone of Influence (ZoI) including the Clonattin Stream. **Designated Conservation sites within 15km** No Natura 2000 sites are within the Zone of Influence. As the main potential vector for impacts would be seen to be via the Clonattin Stream, no additional controls are required besides those outlined below, during the construction and operational phases of the development, to mitigate against potential negative impacts on Court Dunes and Glen pNHA. The mitigation has been designed to ensure that the project will comply with the Water Pollution Acts and standard IFI Conditions in relation to construction and drainage. All construction and operational phase controls will be followed. *Development Construction* Contamination of watercourses. As existing drainage ditches are present on site and substantial instream works are proposed, a project ecologist should be appointed prior to works or site clearance commencing on site. All works in the riparian corridor must be carried out in consultation with and to the satisfaction of IFI and the project ecologist, following the best practice guidelines for construction in the vicinity of watercourses. All works on site and in the riparian corridor should have sufficient mitigation measures to prevent silt from runoff during works. This should include measures outlined by the project ecologist including silt fences, phasing of the project to initially carry out diversion works and immediate landscaping of the riparian corridor following works.

Biodiversity continued	**Riparian Corridor Construction Stage** As significant site clearance is involved in the project and the site is on sloping land adjacent to a watercourse measures need to be put in place to ensure that runoff from the site during construction is contained and that silt is intercepted. A silt interception system will be prepared in consultation with the project ecologist. The purpose of this is to ensure that silt is removed from runoff prior to entering the stream and drainage ditches throughout the construction process. The following measures will be carried out to ensure that the site runoff is suitably contained during construction: a) Site works will commence with the submission of a construction methodology to IFI. It should be noted that the watercourse will be fisheries compliant and will contain features for biodiversity enhancement. Following agreement of the methodology with IFI the excavation of the riparian diversion will be carried out in the dry, isolated from the existing watercourse. Only when all dry works have been completed and inspected by the ecologist and IFI will the stream become live. b) Once the culvert has been carried out the riparian buffer of 10m will be established, landscaped and marked out prior to site clearance works on the remainder of the site. It is important that this area is cleared and landscaped in late spring/early summer as a portion of this area is within the potential flood zone of the river and landscaping needs to be well established prior to any risk of flooding, in order to limit any silt entering the stream during a flood. c) The placing of silt fences in the riparian corridor will be carried out to prevent runoff entering the newly established riparian corridor. It is important that the bases of these are buried deeply in the soil as this area has the potential to be flooded and they could cause downstream impacts if not installed correctly. The riparian buffer of 10m will be established, landscaped and marked out to avoid machinery access, prior to site clearance works on the remainder of the site. d) A temporary trench will be dug at the edge of the riparian corridor so that any runoff during works will run parallel to the river and be caught by silt fences and measures in the trench. All planting and landscaping should be carried out immediately. e) Following the completion of this element of the project this area of the site will be closed off to machinery access. Drainage on site outside the riparian corridor. a) Channels will be prepared on site, in the vicinity of future access roads. Within these channels silt fences/barriers will be placed and will consist of woven/terram style material of suitable density to remove the majority of silt from runoff. These will be maintained throughout the construction phase to ensure efficiency, prior to the installation of the permanent drainage network. b) Silt fences will be placed along the edge of the riparian corridor (outside of future construction areas) to capture runoff from the site. These will also prevent machinery from entering the riparian corridor.

Biodiversity continued	c) Mitigation measures including silt fences will be in place (in consultation with the project ecologist and IFI) to capture silt from runoff and prevent it from entering the stream during the culvert works. d) Appropriate storage and settlement facilities will be provided on site. This could include the provision of silt and petrochemical interception for water pumped on site (if required). e) Fuel, oils and Chemicals will be stored on an impervious base with a bund. Under LEED there will be a strategy put in place to prevent pollution of the watercourse. In most cases this will involve collecting the run-off and routing it to treatment by filtration, settlement or specialist techniques. Additional mitigation if required will be placed on roadworks to capture silt that may not be caught by road sweeping, before runoff enters the Dawson's Demesne Stream. **Culvert Installation Methodology** In addition to having a direct hydrological pathway to a pNHA downstream and the necessity to comply with Water Pollution Acts, it has been deemed necessary to limit the potential impact of the works and implement mitigation measures and carry out the instream works as follows: *Pre-Installation:* Prior to carrying out the works the project will: • Submit a final methodology statement at least 1 month before the proposed in stream works to IFI. • Notify IFI one week in advance of each culvert works commencing. • Electrofish the water within the full extent of the works location to 50m downstream (if required by IFI), at the start of the project. Remove any fish and transport downstream (It would be preferable if this was carried out by IFI on the day of connection works if possible). *Installation process (live downstream culvert):* • A temporary stream diversion will be prepared with a 900mm diameter pipe. • A minimum of four independent terram baffles will be placed downstream of the proposed works. • The stream will be diverted through the pipe which will allow access to the bed of the original stream. • The culvert will be installed in the dry while the river remains on its diverted course. The excavation will leave two areas of soil at either end of the diversion to prevent the river from entering the works area. • Pumps will be placed within the diversion area should any seepage, rainwater or groundwater enter the works area. These are to be connected to silt busters/or to the onsite swales as directed by the project ecologist (and not directly back to the stream without filtering). Any seepage/rainwater/groundwater will be pumped onto open ground north of the river and allowed to seep naturally into the groundwater. No runoff will be allowed back into the stream. • The excavated material will be stockpiled on site away from the watercourse (min 20m). • The new culvert sections will be lifted with the crane and placed on to the bed of Sand/stone as required.

Biodiversity continued	• Minor adjustments if required will be made to ensure the first section is correct for line and level. • The remaining sections will be installed using the same procedure. • On completion of the installation backfilling will commence to the sides of the culvert. • Backfill material will be placed and compacted in layers. • New ducting sections will be placed downstream of the culvert. • The ecologist will be in attendance for environmentally sensitive works. • On completion of the backfilling the small remaining bunds trench will be removed. • Silt interception methods will be implemented downstream prior to instream works. • Instream biodiversity elements will be placed within the watercourse as instructed by the ecologist/IFI. • A gradual switchover will be implemented and the stream will flow through the newly installed culvert under supervision of project ecologist. • A gradual switch over to the diversion will be monitored by the project ecologist. This will involve the stream being gradually dammed both upstream and downstream of the crossing location using sandbags. • Once the full flow is in the diversion and stable the Existing stream bed will then be gradually blocked off with sandbags and final elements of rock armour will be carried out behind sand bags. • When complete downstream mitigation measures will be removed. **Designed-in Mitigation** • All in-stream works methodologies must have prior approval of Inland Fisheries Ireland. • Best available technology (BAT) mitigation measures designed by project ecologist • Staging of project to reduce risks to watercourses from contamination with all instream works being carried out in Phase 1 of the project, where the stream is diverted, landscaped and protected from all subsequent phases. • Local watercourses must be protected from dust, silt and surface water throughout the works. • Local silt traps established throughout site. • In stream works to be carried out in full consultation with and to the advice of Inland Fisheries Ireland and the project ecologist. • Staging of project to initially stabilise, isolate, fence off watercourse on site • Mitigation measures on site include dust control, stockpiling away from watercourses and drains • Pollution control and mitigation on site • Stockpiling of loose materials will be kept away from watercourses and drains. A risk based approach will be taken. • Stockpiles and runoff areas following clearance will have suitable barriers to prevent runoff of fines into the drainage system and watercourses. • Fuel, oil and chemical storage will be sited within a bunded area. A risk based approach will be taken. • Bunds will be kept clean and spills within the bund area will be cleaned immediately to prevent groundwater contamination.

Biodiversity continued	• During the construction works silt traps will be put in place in the vicinity of all runoff channels the stream to prevent sediment entering the watercourse. • Petrochemical interception and bunds in refuelling area • Planting in the vicinity of the stream crossings should be put in place as soon as possible to allow biodiversity corridors to establish. • On-site inspections to be carried out by project ecologist. • Maintenance of any drainage structures (e.g. de-silting operations) must not result in the release of contaminated water to the surface water network. • No entry of solids to the associated stream or drainage network during the connection of pipework to the public water system • Landscaping of the Riparian corridor should be carried out to the satisfaction of IFI. • During the works silt traps will be put in place • No discharges will be to the watercourse during and post works • Silt traps established throughout site including a double silt fence between the site and the watercourse. • Sufficient onsite cleaning of vehicles prior to leaving the site and on nearby roads, will be carried out, particularly during groundworks. • The Site Manager will be responsible for the pollution prevention programme and will ensure that at least daily checks are carried out to ensure compliance. A record of these checks will be maintained. • The site compound will include a dedicated bund for the storage of dangerous substances including fuels, oils etc. Refuelling of vehicles/machinery will only be carried out within the bunded area. • A project ecologist must be appointed and be consulted in relation to all onsite drainage during construction works. Consultation with the project ecologist will not involve the formulation of new mitigation measures for the purposes of protecting any European Site, and relate only to the implementation of those mitigation measures already stated in the submission or the formulation of mitigation for other purposes. • Dewatering of excavations may be necessary. Appropriate monitoring of groundwater levels during site works will be undertaken. Standard construction phase filtering of surface water for suspended solids will be carried out. Unfiltered surface water discharges or runoff are not permitted from the site into the drainage ditches or stream. Trenched double silt fencing shall be put in place along boundary of the proposed development site with 10m buffer from the Clonattin Stream. This fencing must be in place as one of the first stages on site and prior to the full site clearance. The silt fencing will act as a temporary sediment control device to protect the watercourse from sediment and potential site water runoff but also act as a tree protection zone for the riparian buffer. The fencing will be inspected twice daily, based on site and weather conditions, for any signs of contamination or excessive silt deposits.

Biodiversity continued	**Air & Dust** Dust may enter the Clonattin Stream via air or surface water with potential downstream impacts. Mitigation measures will be carried out reduce dust emissions to a level that avoids the possibility of adverse effects on the Clonattin Stream. The main activities that may give rise to dust emissions during construction include the following: • Excavation of material; • Materials handling and storage; • Movement of vehicles (particularly HGV's) and mobile plant. • Contaminated surface runoff *Mitigation measures to be in place:* • Following the instream works, maintain the existing 10m buffer with the Clonattin Stream with a double layer of silt fences • Consultation will be carried with an ecologist throughout the construction phase; • Trucks leaving the site with excavated material will be covered so as to avoid dust emissions along the haulage routes. • Speed limits on site (15kmh) to reduce dust generation and mobilisation. • The stream is to be protected from dust on site. This may require additional measures in the vicinity of the building during demolition e.g. placing of terram/protective material over the stream. *Site Management* • Regular inspections of the site and boundary should be carried out to monitor dust, records and notes on these inspections should be logged. • Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken. • Make the complaints log available to the local authority when asked. • Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the log book. *Waste* • Avoid bonfires and burning of waste materials. *Measures Specific to Earthworks* • Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable. • Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable. • Only remove the cover in small areas during work and not all at once. • During dry and windy periods, and when there is a likelihood of dust nuisance, a bowser will operate to ensure moisture content is high enough to increase the stability of the soil and thus suppress dust. • Due to the proximity of the Clonattin Stream an ecologist will oversee works in particular the excavation of material from the perimeter of the site. • The Contractor will be required to consult with an ecologist prior to the beginning of works to identify any additional measures that may be appropriate and/or required.

Biodiversity continued	*Storage/Use of Materials, Plant & Equipment* • Materials, plant and equipment shall be stored in the proposed site compound location; • Plant and equipment will not be parked within 50m of the Dawson's Demesne Stream at the end of the working day; • Hazardous liquid materials or materials with potential to generate run-off shall not be stored within 50m of the Clonattin Stream. • All oils, fuels and other hazardous liquid materials shall be clearly labelled and stored in an upright position in an enclosed bunded area within the proposed development site compound. The capacity of the bunded area shall conform with EPA Guidelines – hold 110% of the contents or 110% of the largest container whichever is greater; • Fuel may be stored in the designated bunded area or in fuel bowsers located in the proposed compound location. Fuel bowsers shall be double skinned and equipped with certificates of conformity or integrity tested, in good condition and have no signs of leaks or spillages; • Smaller quantities of fuel may be carried/stored in clearly labelled metal Jeri cans. Green for diesel and red for petrol and mixes. The Jeri cans shall be in good condition and have secure lockable lids. The Jeri cans shall be stored in a drip tray when not in use. They will not be stored within 50m of the Clonattin Stream; • Drip trays will be turned upside down if not in use to prevent the collection of rainwater; • Waters collected in drip trays must be assessed prior to discharge. If classified as contaminated, they shall be disposed by a permitted waste contractor in accordance with current waste management legal and regulatory requirements; • Plant and equipment to be used during works, will be in good working order, fit for purpose, regularly serviced/maintained and have no evidence of leaks or drips; • No plant used shall cause a public nuisance due to fumes, noise, and leakage or by causing an obstruction; • Re-fuelling of machinery, plant or equipment will be carried out in the site compound as per the appointed Construction Contractor re-fuelling controls; • The appointed Construction Contractor EERP will be implemented in the event of a material spillage; • All persons working will receive work specific induction in relation to material storage arrangements and actions to be taken in the event of an accidental spillage. Daily environmental toolbox talks / briefing sessions will be conducted for all persons working to outline the relevant environmental control measures and to identify any environment risk areas/works. • Consultation with Inland Fisheries Ireland will be carried out pre and post works is essential and to be led by the project ecologist.

Biodiversity continued	**Birds(National Protection)** • Retain hedgerows and trees where possible. • Wildlife corridors provide additional shelter to minimise predation. • "Relevant guidelines and legislation (Section 40 of the Wildlife Acts, 1976 to 2012) Should this not be possible, a pre-works check by a qualified ecologist should be undertaken to ensure nesting birds are absent. This would include nesting gulls on buildings if present. • Nest boxes places on site to compensate for resource loss. • Removal of potential nesting habitats outside of bird breeding season (March to August inclusive). Should this not be possible, a pre-works check by a qualified ecologist should be undertaken to ensure nesting birds are absent **Bats (international Protection)** • Derogation Licence required for demolition of house on site. • Pre Construction survey for bats • Retain hedgerows and ivy cover on trees where possible. • Wildlife corridors provide additional shelter to minimise predation. • Ecologist notified if bats found during demolition • Lighting at all stages should be done sensitively on site with no direct lighting of hedgerows and treelines. • Replanting of the riparian corridor at phase 1 of the project. • 5 bat boxes should be placed on site as advised by the project ecologist to offset the loss of the roosting site. • Lighting of the site should be as lighting plan with no lighting of the riparian corridor, the attenuation pond or central park areas. Light spin should be as per designed lighting plan. Mammals (Terrestrial) • A pre Construction survey should be carried out Amphibians • A pre Construction survey should be carried out

Land, Soil and Geology	The proposed development, to fully utilize the site requires the site to be re-profiled. The developed design has taken cognisance of this and as far as is reasonably practical the cut/fill for the scheme has optimised. It is unavoidable that the site has to be reprofiled but by striving to balance the cut/fill the requirement to bring in excessive volumes of material from off site has been mitigated as far as practical. Prior to commencement existing trees will be cordoned off and a demarcation fence secured around them to ensure their safety. A similar process of cordoning off the local water course, in accordance with the recommendations of the Construction Management Plan will be adhered too to ensure that all salient measures have been taken to protect the stream during the construction phase of the development. Pouring of concrete should be carried out in the dry and allowed to cure. Mixer washings and excess concrete should not be discharged to surface water. Implementation of comprehensive and strict site housekeeping measures to isolate concrete from local surface waters is essential. Oil storage tanks should have secondary containment provided by means of an above ground bund to capture any oil leakage irrespective of whether it rises from leakage of the tank itself or from associated equipment such as filling and off-take points, sighting gauges etc., all of which should be located within the bund. Bund specification should conform to the current best practice for oil storage (Enterprise Ireland BPGC5005). Refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles, will take place in a designated area (or where possible off the site) which will be away from nearby surface water gulleys or drains. In the event of a machine requiring refuelling outside of this area, fuel will be transported in a mobile double skinned tank. An adequate supply of spill kits and hydrocarbon adsorbent packs will be stored in this area. All relevant personnel will be fully trained in the use of this equipment. Guidelines such as “Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors” (CIRIA 532, 2001) will be complied with. Wheel wash facilities should also be provided in a designated area (or where possible off the site).

Hydrology and Water Services	The contractor will be responsible in ensuring the existing storm network to the north, traversing the development lands and the existing attenuation pond are free from waste materials generated during the construction of the proposed development, including the initial site clearance and excavation. Routine visual inspections by the contractor will reduce any risk of excess construction materials causing blockages in the surface water network and and any potential flooding occurring. A maintenance schedule and operational schedule should be established by the contractor for silt and pollution control measures during the construction period. This should be undertaken in consultation with the relevant statutory authorities. Run-off from the working site or any areas of exposed soil should be channelled and intercepted at regular intervals for discharge to silt traps or lagoons with over-flows directed to land rather than to a watercourse. Pouring of concrete should be carried out in the dry and allowed to cure. Mixer washings and excess concrete should not be discharged to surface water. Implementation of comprehensive and strict site housekeeping measures to isolate concrete from local surface waters is essential. Oil storage tank(s) and the associated filling area and distribution pipe work should be at least 10m distant from the surface watercourses. Storage tanks should have secondary containment provided by means of an above ground bund to capture any oil leakage irrespective of whether it rises from leakage of the tank itself or from associated equipment such as filling and off-take points, sighting gauges etc., all of which should be located within the bund. Bund specification should conform to the current best practice for oil storage (Enterprise Ireland BPGC5005). A Site Specific Construction and Environment Management Plan will be developed and implemented during the construction phase. Site inductions will include reference to the procedures and best practice as outlined in the Construction and Environment Management Plan. Surface water runoff from areas stripped of topsoil and surface water collected in excavations will be directed to on-site settlement ponds where measures will be implemented to capture and treat sediment laden runoff prior to discharge of surface water at a controlled rate. Weather conditions and seasonal weather variations will also be taken account of when planning stripping of topsoil and excavations, with an objective of minimizing soil erosion. Hazardous construction materials shall be stored appropriately to prevent contamination of watercourses or groundwater. Spill kits should be kept in designated areas for re-fuelling of construction machinery. • Dewatering measures should only be employed where necessary.

Noise and Vibration	**Noise** With regard to construction activities, best practice control measures for noise and vibration from construction sites are found within BS 5228 (2009 +A1 2014) Code of Practice for Noise and Vibration Control on Construction and Open Sites Parts 1 and 2. Whilst construction noise and vibration impacts are expected to vary during the construction phase depending on the distance between the activities and noise sensitive buildings, the contractor will ensure that all best practice noise and vibration control methods will be used, as necessary in order to ensure impacts at off-site noise sensitive locations are minimised. The best practice measures set out in BS 5228 (2009) Parts 1 and 2 includes guidance on several aspects of construction site mitigation measures, including, but not limited to: · Selection of quiet plant. · Noise control at source. · Screening. · Liaison with the public · Monitoring A detailed comment is offered on these items in the following paragraphs. Noise control measures that will be considered include the selection of quiet plant, enclosures and screens around noise sources, limiting the hours of work and noise and vibration monitoring, where required. <u>Selection of Quiet Plant</u> This practice is recommended in relation to static plant such as compressors and generators. It is recommended that these units be supplied with manufacturers' proprietary acoustic enclosures. The potential for any item of plant to generate noise will be assessed prior to the item being brought onto the site. The least noisy item should be selected wherever possible. Should a particular item of plant already on the site be found to generate high noise levels, the first action should be to identify whether or not said item can be replaced with a quieter alternative. <u>Noise Control at Source</u> If replacing a noisy item of plant is not a viable or practical option, consideration will be given to noise control "at source". This refers to the modification of an item of plant or the application of improved sound reduction methods in consultation with the supplier. For example, resonance effects in panel work or cover plates can be reduced through stiffening or application of damping compounds; rattling and grinding noises can often be controlled by fixing resilient materials in between the surfaces in contact. Referring to the potential noise generating sources for the works under consideration, the following best practice mitigation measures should be considered: • Site compounds will be located in excess of 30m from noise sensitive receptors within the site constraints. The use lifting bulky items, dropping and loading of materials within these areas should be restricted to normal working hours. • For mobile plant items such as dump trucks, excavators and loaders, the installation of an acoustic exhaust and/or maintaining enclosure panels closed during operation can reduce noise levels by up to 10dB. Mobile plant should be switched off when not in use and not left idling.

Noise and Vibration continued	• For steady continuous noise, such as that generated by diesel engines, it may be possible to reduce the noise emitted by fitting a more effective exhaust silencer system or utilising an acoustic canopy to replace the normal engine cover. For concrete mixers, control measures should be employed during cleaning to ensure no impulsive hammering is undertaken at the mixer drum. • For all materials handling ensure that materials are not dropped from excessive heights, lining drops chutes and dump trucks with resilient materials. • For compressors, generators and pumps, these can be surrounded by acoustic lagging or enclosed with in acoustic enclosures providing air ventilation. • Demountable enclosures can also be used to screen operatives using hand tools and will be moved around site as necessary. • All items of plant should be subject to regular maintenance. Such maintenance can prevent unnecessary increases in plant noise and can serve to prolong the effectiveness of noise control measures. <u>Screening</u> Screening is an effective method of reducing the noise level at a receiver location and can be used successfully as an additional measure to all other forms of noise control. Construction site hoarding will be constructed around the site boundaries as standard. The hoarding will be constructed use standard plywood material to provide adequate sound insulation. In addition, careful planning of the site layout will also be considered. The placement of site buildings such as offices and stores will be used, where feasible, to provide noise screening when placed between the source and the receiver. <u>Liaison with the Public</u> A designated environmental liaison officer will be appointed to site during construction works. Any noise complaints should be logged and followed up in a prompt fashion by the liaison officer. In addition, where a particularly noisy construction activity is planned or other works with the potential to generate high levels of noise, or where noisy works are expected to operate outside of normal working hours etc., the liaison officer will inform the nearest noise sensitive locations of the time and expected duration of the noisy works. <u>Monitoring</u> Where required, construction noise monitoring will be undertaken at periodic sample periods at the nearest noise sensitive locations to the development works to check compliance with the construction noise criterion. Noise monitoring should be conducted in accordance with the International Standard ISO 1996: 2017: Acoustics - Description, measurement and assessment of environmental noise. <u>Project Programme</u> The phasing programme will be arranged so as to control the amount of disturbance in noise and vibration sensitive areas at times that are considered of greatest sensitivity. During excavation or when other high noise generating works are in progress on a site at the same time as other works of construction that themselves may generate significant noise and vibration, the working programme will be phased so as to prevent unacceptable disturbance at any time.

Noise and Vibration continued	Vibration The vibration from construction activities will be limited to the values set out in Tables 8.2 and 8.3. Magnitudes of vibration slightly greater than those in the table are normally unlikely to cause cosmetic damage, but construction work creating such magnitudes should proceed with caution. Limit values have been provided for soundly constructed residential and commercial properties.

Air and Climate	<u>Air Quality</u> The pro-active control of fugitive dust will ensure the prevention of significant emissions, rather than an inefficient attempt to control them once they have been released. The main contractor will be responsible for the coordination, implementation and ongoing monitoring of the dust management plan. The key aspects of controlling dust are listed below. Full details of the dust management plan can be found in Appendix 9.3. • The specification and circulation of a dust management plan for the site and the identification of persons responsible for managing dust control and any potential issues; • The development of a documented system for managing site practices with regard to dust control • The development of a means by which the performance of the dust management plan can be monitored and assessed; • The specification of effective measures to deal with any complaints received. At all times, the procedures within the plan will be strictly monitored and assessed. In the event of dust nuisance occurring outside the site boundary, movements of materials likely to raise dust would be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations. <u>Climate</u> Construction traffic and embodied energy of construction materials are expected to be the dominant source of greenhouse gas emissions as a result of the construction phase of the development. Construction vehicles, generators etc., may give rise to some CO_2 and N_2O emissions. However, due to short-term and temporary nature of these works, the impact on climate will not be significant. Nevertheless, some site-specific mitigation measures can be implemented during the construction phase of the proposed development to ensure emissions are reduced further. In particular the prevention of on-site or delivery vehicles from leaving engines idling, even over short periods. Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site. <u>Mitigation Measures (Construction)</u> • Avoid unnecessary vehicle movements and manoeuvring, and limit speeds on site so as to minimise the generation of airborne dust. • Buildings shall be demolished by approved methods and in a manner that reduces the impact on air quality. • Manual Stripping of buildings of internal fixings, metals, glass and asbestos. • A 3m high solid wooden hoarding with a 3m high dust net shall be erected around the entire construction site perimeter giving a total dust barrier height of 6m.

Air and Climate continued	• Use of rubble chutes and receptor skips during construction activities. • All buildings in which asbestos has been identified shall be sealed during the asbestos removal process. Asbestos shall only be removed by an appropriately permitted company. All asbestos waste shall be double bagged, stored in a dedicated sealed waste container/skip prior to removal off-site for disposal at an appropriately permitted/licenced facility. Records of all asbestos waste removed from site shall be maintained by the site manager and certificates of destruction shall be provided by the asbestos removal contractor. Asbestos surveys shall be conducted by an appropriately HSE approved contractor. • During dry periods, dust emissions from heavily trafficked locations (on and off site) will be controlled by spraying surfaces with water and wetting agents. • Hard surface roads will be swept to remove mud and aggregate materials from their surface while any unsurfaced roads will be restricted to essential site traffic only. • A road sweeper vehicle shall be on-site at all times to clean soiled public roads in the vicinity of the site. • A mobile wheel wash unit shall be installed at the site exit to wash down the wheels of all trucks exiting the site. • An independent environmental consultant shall be appointed by the contractor to prepare a dust control and monitoring method statement prior to the commencement of site activities. • A weekly inspection of each dust gauge will ensure that the site manager identifies at the earliest instance if dust suppression techniques shall be implemented at the project site areas. • Re-suspension in the air of spillages material from trucks entering or leaving the site will be prevented by limiting the speed of vehicles within the site to 10kmh and by use of a mechanical road sweeper. • The overloading of tipper trucks exiting the site shall not be permitted. • Aggregates will be transported to and from the site in covered trucks. • Where the likelihood of windblown fugitive dust emissions is high and during dry weather conditions, dusty site surfaces will be sprayed by a mobile tanker bowser. • Wetting agents shall be utilised to provide a more effective surface wetting procedure. • Exhaust emissions from vehicles operating within the construction site, including trucks, excavators, diesel generators or other plant equipment, will be controlled by the contractor by ensuring that emissions from vehicles are minimised by routine servicing of vehicles and plant, rather than just following breakdowns; the positioning of exhausts at a height to ensure adequate local dispersal of emissions, the avoidance of engines running unnecessarily and the use of low emission fuels. • All plant not in operation shall be turned off and idling engines shall not be permitted for excessive periods. • Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind. Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods.

Air and Climate continued	• Material stockpiles containing fine or dusty elements including top soils shall be covered with tarpaulins. • Where drilling or pavement cutting, grinding or similar types of stone finishing operations are taking place, measures to control dust emissions will be used to prevent unnecessary dust emissions by the erection of wind breaks or barriers. All concrete cutting equipment shall be fitted with a water dampening system. • A programme of air quality monitoring shall be implemented at the site boundaries for the duration of construction phase activities to ensure that the air quality standards relating to dust deposition and PM_{10} are not exceeded. Where levels exceed specified air quality limit values, dust generating activities shall immediately cease and alternative working methods shall be implemented. • A complaints log shall be maintained by the construction site manager and in the event of a complaint relating to dust nuisance, an investigation shall be initiated. Table 9.18 presents a summary of dust control techniques which will be implemented at the site during activities.
Landscape and Visual	To reduce the potential negative impacts during the construction phase, good site management and housekeeping practices will be adhered to. The visual impact of the site compounds and scaffolding visible during the construction phase are of a temporary nature only and therefore require no remedial action. The areas set aside for open spaces will be fenced off with no compounds or storage of materials taking place in these areas, in accordance with an agreed Construction Management Plan. To ensure the successful retention of trees and hedgerows, an Arborist is recommended to be retained by the contractor or developer to monitor and advise any works within the Root Protection Zones of retained trees.
Traffic and Transportation	The lead contractor appointed for the construction of the development shall be required to prepare a Construction Management Plan (CMP) that shall include a plan for the scheduling and management of construction traffic. This CMP shall outline measures to be taken to mitigate the impact of construction traffic on the surrounding road network. Such measures are expected to include: • Prohibition of haulage vehicles parking at the entrance to the site or stopping along their access routes. • Limiting the number of haulage vehicles travelling in convoy to a maximum of two vehicles at any time. • Maintaining a minimum separation of 250m at all times between haulage vehicles travelling to and from site. • Conducting all loading of excess material within the site boundary. In addition, it is expected that construction-related vehicle movements shall be minimised through: • Consolidation of delivery loads to/from the site. • Scheduling large deliveries to occur outside of peak periods. • Use of precast/prefabricated materials where possible. • Reuse on site wherever possible of 'cut' material generated by the construction works. • Provision of adequate storage space on site for material and plant. • Promoting the use of public transport by construction personnel. To minimise the impact of dirt and debris associated with construction, the following measures shall be taken to ensure that the site and surrounding public roads are kept clean and tidy: • A regular program of site tidying shall be established to ensure a safe and orderly site. • Scaffolding shall have debris netting attached to prevent materials and equipment being scattered by the wind. • Food waste shall be strictly controlled on all parts of the site. • Mud spillages on roads and footpaths outside the site shall be cleaned regularly and shall not be allowed to accumulate. • Wheel wash facilities shall be provided for vehicles exiting the site. • In the event of any fugitive solid waste escaping the site, it shall be collected immediately and removed.

Material Assets	As noted, the potable water and foul drainage system has been designed to Irish Water standards and prior to any construction work commencing on site the proposed water main design will be required to be vetted and approved by Irish Water. This requirement will ensure that any adverse effects which maybe experienced during or following completed can be mitigated against. The proposed surface water arrangement and proposed design takes into consideration the best practices for this type of development. As such the avoidance, remedial and mitigation measures, where required are minimum and will conform to the industry norm for such works. Where possible backup network supply to any services will be provided should the need for relocation or diversion or existing services be required otherwise relocation or diversion works will be planned to incur minimal impact, with users notified in advance of any works. Connections to the existing telecommunications networks will be coordinated with the relevant utility provider and carried out by approved contractors.
Waste	A project specific C&D WMP has been prepared in line with the requirements of the guidance document issued by the DoEHLG. Adherence to the high-level strategy presented in this C&D WMP will ensure effective waste management and minimisation, reuse, recycling, recovery and disposal of waste material generated during the construction phase of the proposed development. CS Consulting Engineers have estimated that 15,000m^3 of material will be generated from the excavations required to facilitate construction. Contractor(s) will endeavor to ensure material taken offsite is reused or recovered off-site or disposed of at authorised facility. In addition, the following mitigation measures will be implemented: • Building materials will be chosen with an aim to 'design out waste'. • On-site segregation of waste materials will be carried out to increase opportunities for off-site reuse, recycling and recovery – it is anticipated that the following waste types, at a minimum, will be segregated: - Concrete rubble (including ceramics, tiles and bricks). - Plasterboard. - Metals. - Glass; and - Timber. • Left over materials (e.g. timber off-cuts, broken concrete blocks/bricks) and any suitable construction materials shall be re-used on-site, where possible. • All waste materials will be stored in skips or other suitable receptacles in designated areas of the site. • Any hazardous wastes generated (such as chemicals, solvents, glues, fuels, oils) will also be segregated and will be stored in appropriate receptacles (in suitably bunded areas, where required). • A waste manager will be appointed by the main contractor(s) to ensure effective management of waste during the excavation and construction works. • All construction staff will be provided with training regarding the waste management procedures.

Waste continued	• All waste leaving site will be reused, recycled or recovered where possible to avoid material designated for disposal. • All waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licenced facilities; and • All waste leaving the site will be recorded and copies of relevant documentation maintained. These mitigation measures will ensure that the waste arising from the construction phase of the development is dealt with in compliance with the provisions of the *Waste Management Act 1996*, as amended, associated Regulations, the *Litter Pollution Act 1997* and the *SWR Waste Management Plan (2015 - 2021)*. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved and will encourage sustainable consumption of resources.
Cultural Heritage and Archaeology	It is recommended that the access road is subject to archaeological testing once the lands become available. Should any archaeological remains be identified in this area, further archaeological mitigation may be required, such as preservation in-situ or by record. It is recommended that all ground disturbances associated with the proposed development be monitored by a suitably qualified archaeologist. If any features of archaeological potential are discovered during the course of the works further archaeological mitigation may be required, such as preservation in-situ or by record. Any further mitigation will require approval from the National Monuments Service of the DoCHG.

16.3 OPERATIONAL PHASE

Population and Human Health	The proposed development has been designed to avoid negative impacts on population and human health through the provision of various physical and social infrastructure as part of the development as are outlined in Chapter 3 of this EIAR. No addition mitigations measures are considered necessary.
Biodiversity	Operational mitigation measures are primarily directed towards maintenance of mitigation measures that have been put in place during the construction phase. This would be directed towards ensuring compliance with Water Pollution Acts through the maintenance of onsite drainage infrastructure and ensuring lighting is maintained as per lighting plan. No additional operational mitigation measures are required.
Land, Soil and Geology	The sources of pollution that could potentially have an effect on the land and soils during the operational phase of the development will be oil and fuel leaks from parked cars, service vehicles, HGV delivery's etc. Hydrocarbon interceptors such as the tree pit drainage etc will be provided in storm water drainage network and Petrol interceptors will be installed within the development to cater for these oil/fuel leaks as required and prevent contamination of the subsoils and groundwater etc. Run-off from hardstanding areas will pass through a closed drainage system, which will incorporate silt traps and oil/petrol interceptors, to mitigate the possibility of potentially contaminated surface water from contaminating the soil and bedrock geology. This drainage system will then discharge into the existing onsite attenuation pond and with the outflow restricted to greenfield runoff rates to the adjacent stream (Clonattin Upper Stream). It is not predicted that there will be any adverse effects on the soils and geology during the operational phase of the development.
Hydrology and Water Services	The proposed re-development of the site will not have any physical impact on the areas adjacent to the development site. These areas, while they will be enhanced with improved soft landscaping will not infringe or remove any capacity from the naturally occurring flood plain. Also, to mitigate against the increased storm water runoff which will be generated following the development of the scheme will discharge to the existing attenuation pond which has been sized to incorporate the development lands. The flow rate at this outfall of the pond to the Clonattin Upper Stream will remain unchanged from current flows; by restricting the flow, the likelihood of the proposed development adversely affecting or contributing to downstream flooding is mitigated.
Noise and Vibration	<u>Additional Traffic on Adjacent Roads</u> During the operational phase of the development, noise mitigation measures with respect to the outward impact of traffic from the development are not deemed necessary. <u>Mechanical Services Plant</u> Taking into account that sensitive receivers within the development are much closer than off-site sensitive receivers, once the relevant noise criteria is achieved within the development it is expected that there will be no negative impact at sensitive receivers off site, and therefore no further mitigation required.
Air and Climate	No additional mitigation measures are required as the operational phase of the proposed development as it is predicted to have an imperceptible impact on ambient air quality and climate. The operational phase mitigation by design measures to minimise the impact of the development on air quality and climate are as follows: <u>Mitigation Measures (Operational)</u> • Thermally efficient glazing systems on all units • Mechanical Ventilation and Heat Recovery (MVHR) systems or equivalent installed in all apartments • Thermal insulation of walls and roof voids of all units • Natural Gas heating in all units • Inclusion of electric car charging points to encourage electric vehicle ownership
Landscape and Visual	Mitigation measures have been incorporated into the design to minimise visual intrusion and adverse landscape impact whilst integrating the development into the surrounding landscape character. Tree and other planting are proposed throughout the site and particularly within the main open spaces. An extensive landscape programme is proposed to create the optimum landscape solution for this new residential development. The extensive landscaping proposal will help soften the visual impact of the development and with future maturing of planting will lead to a very attractive residential layout that can integrate well with the adjoining uses. Existing boundary hedgerow and planting will be maintained and enhanced where possible to provide natural screening of the site as currently provided. Streetscape design will incorporate planting and landscaping to reduce the visual impact of the buildings and to integrate the proposed buildings with the surrounding environment.

Traffic and Transportation	As described in the accompanying Traffic Impact Assessment report, the development shall incorporate several design elements intended to mitigate the impact of the development on the operation of the surrounding road network. These include: • an appropriate level of car parking provision, in line with Local Authority Development Plan standards (for houses) and Apartment Guidelines recommendations (for apartments and duplexes), which shall discourage excessively high vehicle ownership rates and unnecessary vehicular trips to the development (by residents and visitors); and • a high provision of secure bicycle parking, which shall serve to encourage bicycle journeys by both residents and visitors. As described in the accompanying Residential Travel Plan document, a Residential Travel Plan Coordinator shall be appointed for the proposed development, with the remit to implement and oversee an ongoing Residential Travel Plan (RTP). This shall assist residents and their visitors in making the most of sustainable transport opportunities and in avoiding single-occupant car journeys where possible. Briefly, the following mobility management measures are proposed under the Residential Travel Plan: • Creation of an Access Map. • Provision of travel information to development occupants, in the form of Sustainable Travel Welcome Packs and a travel hub website. • Identification of safe walking and cycling routes. • Provision of secure and attractive cycle parking and ancillary facilities for cyclists and pedestrians. • Provision of information on locations of public transport stops, routes, timetables, walking times to main public transport facilities, etc. • Provision of specific advice to development occupants on multi-modal trip planning.

Material Assets	As the proposed completed development will offered for taking in charge to Wexford County Council monitoring of the development site will be the responsibility of the local authority to carry out any maintenance works required. Until such time as the development is taking in charge the developer will be responsibly of monitoring/maintenance the development site. On completion of the construction phase no further mitigation measures are proposed in relation to the electrical and telecommunications infrastructure.

Waste	All waste materials will be segregated into appropriate categories and will be stored in appropriate bins or other suitable receptacles in a designated, easily accessible areas of the site in accordance with the *Wexford County Development Plan 2013 – 2019.* In addition, the following mitigation measures will be implemented: • On-site segregation of all waste materials into appropriate categories including (but not limited to): - Organic/catering waste (including garden waste from landscaping activities). - Dry Mixed Recyclables. - Mixed Non-Recyclable Waste. - Glass. • -Waste electrical and electronic equipment (WEEE) including computers, printers and other ICT equipment. - Batteries (non-hazardous and hazardous) - Fluorescent bulb tubes and other mercury containing waste (if arising). - Cleaning chemicals (pesticides, paints, adhesives, resins, detergents, etc.); and • All waste materials will be stored in colour coded bins or other suitable receptacles in designated, easily accessible locations. Bins will be clearly identified with the approved waste type to ensure there is no cross contamination of waste materials. • All waste collected from the development will be reused, recycled or recovered where possible, with the exception of those waste streams where appropriate facilities are currently not available. • All waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licensed facilities; and • These mitigation measures will ensure the waste arising from the development is dealt with in compliance with the provisions of the *Waste Management Act 1996*, as amended, and all associated Regulations. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved.

Cultural Heritage and Archaeology	Not applicable.