



RECEIVED: 28/05/2026

Chapter 8 – Air Quality

TABLE OF CONTENTS

8. AIR QUALITY	8-1
8.1 Introduction.....	8-1
8.2 Methodology	8-1
8.2.1 Relevant Legislation & Guidance	8-1
8.2.2 Ambient Air Quality Standards.....	8-1
8.2.3 Construction Phase	8-5
8.2.4 Operational Phase.....	8-8
8.2.5 Forecasting Methods and Difficulties Encountered	8-8
8.3 Receiving Environment	8-8
8.3.1 Meteorological Data.....	8-8
8.3.2 Baseline Air Quality	8-11
8.3.3 Sensitivity of the Receiving Environment to Dust.....	8-13
8.4 Characteristics of the Proposed Development.....	8-14
8.4.1 Construction Phase	8-14
8.4.2 Operational Phase.....	8-15
8.5 Potential Impacts of the Proposed Development	8-15
8.5.1 Construction Phase	8-15
8.5.2 Operational Phase.....	8-17
8.6 Mitigation Measures.....	8-17
8.6.1 Construction Phase	8-17
8.6.2 Operational Phase.....	8-19
8.7 Monitoring or Reinstatement Measures	8-19
8.7.1 Construction Phase	8-19
8.7.2 Operational Phase.....	8-20
8.8 Residual Effects of the Proposed Development.....	8-20
8.8.1 Construction Phase	8-20
8.8.2 Operational Phase.....	8-20
8.9 Cumulative Effects of the Proposed Development.....	8-20
8.9.1 Construction Phase	8-20
8.10 Conclusion	8-21
8.11 References	8-22

LIST OF TABLES

Table 8.1: Ambient Air Quality Limit Values	8-2
Table 8.2: WHO Air Quality Guidelines	8-3
Table 8.3: Air Quality and Traffic Significance Criteria	8-4
Table 8.4: IAQM Criteria to Determine Dust Emissions Magnitude	8-6
Table 8.5: Criteria for Determining the Sensitivity of the Area	8-7
Table 8.6: IAQM Criteria to Determine Risk of Dust Impacts	8-7
Table 8.7 Background Air Quality - Nitrogen Dioxide (NO ₂)	8-11
Table 8.8 Background Air Quality - PM ₁₀	8-12
Table 8.9: Background Air Quality - PM _{2.5}	8-12
Table 8.10: Potential Dust Emission Magnitude	8-15
Table 8.11: Sensitivity of the Area	8-16
Table 8.12: Risk of Dust Impacts used to Define Site-Specific Mitigation	8-16
Table 8.13: Construction Phase Dust Mitigation Measures	8-17
Table 8.14: Summary of Committed Developments with Potential for Cumulative Construction Dust Effects	8-20

LIST OF FIGURES

Figure 8.1: Wind Roses for Shannon Airport Meteorological Station	8-10
Figure 8.2: Construction Dust Sensitive Receptors within 250 m of Site	8-14

RECEIVED: 28/05/2026

8. AIR QUALITY

8.1 Introduction

This chapter assesses the likely air quality impacts associated with the Proposed Parkway Valley Large Residential Development (LRD) located at Dublin Road (R445), Limerick, Co. Limerick. The assessment of impacts has been undertaken in the context of current relevant standards and guidance and identifies any requirements or possibilities for mitigation. A full description of the development is available in Chapter 2.

8.2 Methodology

8.2.1 Relevant Legislation & Guidance

The principal guidance and best practice documents used to inform the assessment of potential impacts on air quality are summarised below.

- ▶ Guidance on the Assessment of Dust from Demolition and Construction v2.2 (Institute of Air Quality Management [IAQM] (hereafter referred to as the IAQM Guidelines) (IAQM, 2024);
- ▶ A Guide To The Assessment Of Air Quality Impacts On Designated Nature Conservation Sites (Version 1.1) (IAQM, 2020); and
- ▶ PE-ENV-01106: Air Quality Assessment of Specified Infrastructure Projects (Transport Infrastructure Ireland [TII], 2025a).

In addition to specific air quality guidance documents, the following guidelines were considered and consulted in the preparation of this chapter:

- ▶ Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (hereafter referred to as the Environmental Protection Agency (EPA) Guidelines) (EPA, 2022);
- ▶ Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning & Local Government, 2018); and
- ▶ Environmental Impact Assessment (EIA) Directive Guidance on the Preparation of the Environmental Impact Assessment Report (European Commission, 2017).

8.2.2 Ambient Air Quality Standards

National and European statutory bodies, the Department of the Environment, Heritage and Local Government in Ireland and the European Parliament and Council of the European Union, have set limit values in ambient air for a range of air pollutants to reduce the risk to health from poor air quality. 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.

8.2.2.1 Air Quality Directive

Air quality significance criteria are assessed on the basis of compliance with the appropriate standards or limit values. The applicable standards in Ireland are set out in Directive (EU) 2024/2881 *of the European Parliament and of the Council of 23 October 2024 on ambient air quality and cleaner air for Europe (recast)*. This directive supersedes EU Directive 2008/50/EC *of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe* (CAFE Directive). It sets out air quality standards for pollutants to be reached by 2026 and by 2030.

The Ambient Air Quality Standards Regulations 2022 (S.I. 739 of 2022) (the Air Quality Standards Regulations 2022) further transposed the CAFE Directive and revoked the Air Quality Standards Regulations 2011, as amended. With the adoption of Directive (EU) 2024/2881, Ireland must similarly transpose this directive into national law within the statutory two-year period, i.e. update the Air Quality Standards Regulations, before December 2026.

The ambient air quality limit values for pollutants are set out in Annex I of Directive (EU) 2024/2881. Table 1 of Annex I in Directive (EU) 2024/2881 sets out the updated air quality limit values for pollutants to be achieved by 1 January 2030, these are more closely aligned with the Interim Target 4 in the 2021 WHO air quality guidelines. Table 2 of Annex I in Directive (EU) 2024/2881 sets out the limit values for air pollutants which are to be achieved by 11 December 2026 and are also applicable up to 2030. The limit values in Table 2 of Annex I are the same as the limits set under Directive 2008/50/EC and the Air Quality Standards Regulations 2022.

In relation to the Proposed Development, the applicable limit values are for nitrogen dioxide (NO₂) and particulate matter (PM₁₀ and PM_{2.5}). Table 8.1 outlines the limit values pre-2030 and post-2030 for the specified pollutants. For the purposes of this assessment the post-2030 limit values set out in Table 1 of Annex I of Directive (EU) 2024/2881 have been applied. This is in line with the TII PE-ENV-01106 guidance (2025a) and ensure a conservative approach to the assessment.

Table 8.1: Ambient Air Quality Limit Values

Pollutant	Directive (EU) 2024/2881 Annex I Table 2		Directive (EU) 2024/2881 Annex I Table 1	
	Limit Type	Limit Value (to be attained by 2026 and applicable until 2030)	Limit Type	Limit Value
Nitrogen Dioxide (NO ₂)	Hourly limit for protection of human health - not to be exceeded more than 18 times/year	200 µg/m ³	Hourly limit for protection of human health - not to be exceeded more than 3 times/year	200 µg/m ³
	n/a	n/a	24-hour limit for protection of human health - not to be exceeded more than 18 times/year	50 µg/m ³
	Annual limit for protection of human health	40 µg/m ³	Annual limit for protection of human health	20 µg/m ³
Particulate Matter (as PM ₁₀)	24-hour limit for protection of human health - not to be exceeded more than 35 times/year	50 µg/m ³	24-hour limit for protection of human health - not to be exceeded more than 18 times/year	45 µg/m ³
	Annual limit for protection of human health	40 µg/m ³	Annual limit for protection of human health	20 µg/m ³

Pollutant	Directive (EU) 2024/2881 Annex I Table 2		Directive (EU) 2024/2881 Annex I Table 1	
	Limit Type	Limit Value (to be attained by 2026 and applicable until 2030)	Limit Type	Limit Value
Particulate Matter (as PM _{2.5})	n/a	n/a	24-hour limit for protection of human health - not to be exceeded more than 18 times/year	25 µg/m ³
	Annual limit for protection of human health	25 µg/m ³	Annual limit for protection of human health	10 µg/m ³

a. Note µg/m³ = micrograms per cubic metre.

8.2.2.2 WHO Air Quality Guidelines & Clean Air Strategy

In April 2023, the Government of Ireland published the *Clean Air Strategy for Ireland* (Government of Ireland, 2023), which provides a high-level strategic policy framework needed to reduce air pollution. The strategy commits Ireland to achieving the 2021 WHO Air Quality Guidelines Interim Target 3 (IT3) by 2026 (Table 8.2), the IT4 targets by 2030 and the final targets by 2040 (Table 13.2). The strategy notes that a significant number of EPA monitoring stations observed air pollution levels in 2021 above the WHO targets; 80% of these stations would fail to meet the final PM_{2.5} target of 5 µg/m³. The strategy also acknowledges that “meeting the WHO targets will be challenging and will require legislative and societal change, especially with regard to both PM_{2.5} and NO₂”.

Annex II of Directive (EU) 2024/2881 gives assessment thresholds which align with the clean air strategy final 2040 WHO targets. Directive (EU) 2024/2881 states that “Member States shall endeavour to achieve and preserve the best ambient air quality and a high level of protection of human health and the environment, with the aim of achieving a zero-pollution objective as referred to in Article 1(1), in line with WHO recommendations, and below the assessment thresholds laid down in Annex II.”

These assessment thresholds relate to monitoring of ambient air quality by Member States, where “exceedances of the assessment thresholds specified in Annex II shall be determined on the basis of concentrations during the previous 5 years where sufficient data are available. An assessment threshold shall be deemed to have been exceeded if it has been exceeded during at least 3 separate years out of those previous 5 years.”

Table 8.2: WHO Air Quality Guidelines

Pollutant	Limit Type	IT3 (2026)	IT4 (2030)	Final Target (2040)
NO ₂	24-hour limit for protection of human health	-	-	25 µg/m ³
	Annual limit for protection of human health	20 µg/m ³	-	10 µg/m ³
PM (as PM ₁₀)	24-hour limit for protection of human health	75 µg/m ³	50 µg/m ³	45 µg/m ³

Pollutant	Limit Type	IT3 (2026)	IT4 (2030)	Final Target (2040)
	Annual limit for protection of human health	30 µg/m ³	20 µg/m ³	15 µg/m ³
PM (as PM _{2.5})	24-hour limit for protection of human health	37.5 µg/m ³	25 µg/m ³	15 µg/m ³
	Annual limit for protection of human health	15 µg/m ³	10 µg/m ³	5 µg/m ³

The applicable air quality limit values for the purposes of this assessment are those set out in Table 8.1.

8.2.2.3 Dust Deposition Guidelines

The concern from a health perspective is focused on particles of dust that are less than 10 microns (PM₁₀) and less than 2.5 microns (PM_{2.5}). The EU ambient air quality standards outlined in Table 8.1 have set ambient air quality limit values for PM₁₀ and PM_{2.5}.

With regards to larger dust particles that can give rise to nuisance dust, there are no statutory guidelines regarding the maximum dust deposition levels that may be generated during the construction phase of a development in Ireland. Furthermore, no criteria have been stipulated for nuisance dust for this specific type of Proposed Development.

With regard to dust deposition, the German TA-Luft standard for dust deposition (non-hazardous dust) (German VDI, 2002) sets a maximum permissible emission level for dust deposition of 350 mg/m²/day averaged over a one-year period at any receptors outside the site boundary. The TA-Luft standard has been applied for the purpose of this assessment based on recommendations from the EPA in Ireland in the document titled *Environmental Management Guidelines - Environmental Management in the Extractive Industry (Non-Scheduled Minerals)* (EPA, 2006). The document recommends that the TA-Luft limit of 350 mg/m²/day be applied to the site boundary of quarries. This limit value can be implemented with regard to dust impacts from construction of the Proposed Development, in terms of both sensitive human and ecological receptors.

8.2.2.4 Air Quality Significance Criteria

The TII document *Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106* (TII, 2025a) details a methodology for determining air quality impact significance criteria for road schemes which can be applied to any project that causes a change in traffic. The degree of impact is determined based on the percentage change in pollutant concentrations relative to the Do-Nothing scenario. The TII significance criteria are outlined in Table 4.9 of *Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106* (TII, 2025a) and reproduced in Table 8.3 below. These criteria have been adopted for the Proposed Development to predict the impact of NO₂, PM₁₀ and PM_{2.5} emissions as a result of the Proposed Development.

Table 8.3: Air Quality and Traffic Significance Criteria

Long Term Average Concentration at Receptor in Assessment Year	% Change in Concentration Relative to Air Quality Standard Value (AQLV)			
	1%	2-5%	6-10%	>10%
75% or less of AQLV	Neutral	Neutral	Slight	Moderate
76 – 94% of AQLV	Neutral	Slight	Moderate	Moderate
95 – 102% of AQLV	Slight	Moderate	Moderate	Substantial

Long Term Average Concentration at Receptor in Assessment Year	% Change in Concentration Relative to Air Quality Standard Value (AQLV)			
	1%	2-5%	6-10%	>10%
103 – 109% of AQLV	Moderate	Moderate	Substantial	Substantial
110% or more of AQLV	Moderate	Substantial	Substantial	Substantial

Source: TII (2025a) Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106

As per Table 8.3 a neutral effect is one where a change in concentration at a receptor is:

- ▶ 5% or less where the Opening Year, without the Proposed Development, annual mean concentration is 75% or less of the standard; or
- ▶ 1% or less where the Opening Year, without the Proposed Development, annual mean concentration is 94% or less of the standard.

Where an effect does not meet the criteria for neutral, as described above, the effect can either be positive or negative. The TII guidance (TII, 2025a) states that “*the evaluation of significance of effects for the operational phase should be undertaken for the Opening Year only as the Design Year is likely to show lower total pollutant concentrations and changes in concentration*” (TII, 2025a).

Non-significant effects (i.e. of local importance only) are ‘neutral’ or ‘slight’ changes in concentrations while significant effects can be changes in pollutant concentrations that are either ‘moderate’ or ‘substantial’. However, the TII guidance (TII, 2025) states that these must be considered in the context of the project and ‘moderate’ or ‘substantial’ increases are not necessarily always significant effects.

The impact descriptors in Table 8.3 are used to describe the impact at each modelled receptor location, and the significance of the impacts is then determined, aligning with the terminology in the EPA guidelines (EPA, 2022). Whilst it may be determined that there are ‘slight’, ‘moderate’ or ‘substantial’ impacts at one or more receptors, an overall judgement should be made of whether the Proposed Development is ‘significant’ or ‘not significant’ in terms of air quality. Factors to consider when determining the overall significance of a Proposed Development are provided in Table 4.10 of the TII guidance (TII, 2025a).

8.2.3 Construction Phase

8.2.3.1 Dust Assessment

The Institute of Air Quality Management in the UK (IAQM) guidance document ‘*Guidance on the Assessment of Dust from Demolition and Construction*’ (IAQM, 2024) outlines an assessment method for predicting the impact of dust emissions from construction activities based on the scale and nature of the works and the sensitivity of the area to dust impacts. The IAQM methodology has been applied to the construction phase of this development to predict the likely risk of dust impacts in the absence of mitigation measures and to determine the level of site-specific mitigation required. The use of UK guidance is recommended by Transport Infrastructure Ireland in their guidance document *Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106* (TII, 2025a).

The major dust generating activities are divided into four types within the IAQM guidance (IAQM, 2024) to reflect their different potential impacts. These are:

- ▶ Demolition;
- ▶ Earthworks;
- ▶ Construction; and
- ▶ Trackout (transport of dust and dirt from the construction site onto the public road network).

The magnitude of each of the four categories is divided into large, medium or small scale depending on the nature of the activities involved. The criteria for determining the category for the works involved are outlined in Table 8.4, these are based on the IAQM guidance (IAQM, 2024). The magnitude of each activity is combined with the overall sensitivity of the area to determine the risk of dust impacts from site activities. This allows the level of site-specific mitigation to be determined.

Table 8.4: IAQM Criteria to Determine Dust Emissions Magnitude

Dust Emission Magnitude		
Small	Medium	Large
Demolition		
▶ Total building volume <12,000 m³ ▶ Construction material with low potential for dust release (e.g. metal cladding or timber) ▶ Demolition activities <6 m above ground ▶ Demolition during wetter months	▶ Total building volume 12,000 - 75,000 m³ ▶ Potentially dusty construction material ▶ Demolition activities 6 – 12 m above ground level	▶ Total building volume >75,000 m³ ▶ Potentially dusty construction material (e.g. concrete) ▶ On-site crushing and screening ▶ Demolition activities >12 m above ground level
Earthworks		
▶ Total site area <18,000 m² ▶ Soil type with large grain size (e.g. sand) ▶ <5 heavy earth moving vehicles active at any one time ▶ Formation of bunds <3 m in height ▶ Earthworks during wetter months	▶ Total site area 18,000 m² - 110,000 m² ▶ Moderately dusty soil type (e.g. silt) ▶ 5 – 10 heavy earth moving vehicles active at any one time ▶ Formation of bunds 3 – 6 m in height	▶ Total site area >110,000 m² ▶ Potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size) ▶ >10 heavy earth moving vehicles active at any one time ▶ Formation of bunds >6 m in height
Construction		
▶ Total building volume <12,000 m³ ▶ Construction material with low potential for dust release (e.g. metal cladding or timber)	▶ Total building volume 12,000 - 75,000 m³ ▶ Potentially dusty construction material (e.g. concrete) ▶ On-site concrete batching	▶ Total building volume >75,000 m³ ▶ On-site concrete batching ▶ Sandblasting
Trackout (Truck Movements)		
▶ <20 HDV (>3.5 t) outward movements in any one day ▶ Surface material with low potential for dust release ▶ Unpaved road length <50 m	▶ 20 – 50 HDV (>3.5 t) outward movements in any one day ▶ Moderately dusty surface material (e.g. high clay content) ▶ Unpaved road length 50 – 100 m	▶ >50 HDV (>3.5 t) outward movements in any one day ▶ Potentially dusty surface material (e.g. high clay content) ▶ Unpaved road length >100 m

The sensitivity of the area must then be assessed as outlined below. Both receptor sensitivity and proximity to proposed works areas are taken into consideration. For the purposes of this assessment, high sensitivity receptors are regarded as residential properties where people are likely to spend the majority of their

time. Commercial properties and places of work are regarded as medium sensitivity while low sensitivity receptors are places where people are present for short periods or do not expect a high level of amenity. Table 8.5 outlines the criteria for determining the sensitivity of the area to dust soiling, dust-related human health effects and ecological impacts as per the IAQM guidance (IAQM, 2024).

Table 8.5: Criteria for Determining the Sensitivity of the Area

Sensitivity of the Area to Dust Soiling Effects on People and Property						
Receptor Sensitivity	Number of Receptors	Distance From Source (m)				
		<20	<50	<100	<250	
High	>100	High	High	Medium	Low	
	10 - 100	High	Medium	Low	Low	
	1 - 10	Medium	Low	Low	Low	
Medium	>1	Medium	Low	Low	Low	
Low	>1	Low	Low	Low	Low	
Sensitivity of the Area to Human Health Impacts						
Receptor Sensitivity	Annual Mean PM₁₀ Concentration	Number of Receptors	Distance from Source (m)			
			<20	<50	<100	<250
High	< 24 µg/m ³	>100	Medium	Low	Low	Low
		10 - 100	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low
Medium	< 24 µg/m ³	>10	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low
Low	< 24 µg/m ³	>1	Low	Low	Low	Low
Sensitivity of the Area to Ecological Impacts						
Receptor Sensitivity	Distance from Source (m)					
	<20		<50			
High	High		Medium			
Medium	Medium		Low			
Low	Low		Low			

Once the dust emission magnitude and sensitivity of the area have been determined the next step, according to the IAQM guidance (IAQM, 2024), is to establish the level of risk by combining the magnitude with the overall sensitivity of the area to dust soiling, human health and ecological effects. The level of risk associated with each activity is determined using the criteria in Table 8.6.

Table 8.6: IAQM Criteria to Determine Risk of Dust Impacts

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
Demolition			
High	High risk	Medium risk	Medium risk
Medium	High risk	Medium risk	Low risk
Low	Medium risk	Low risk	Negligible
Earthworks			
High	High risk	Medium risk	Low risk
Medium	Medium risk	Medium risk	Low risk
Low	Low risk	Low risk	Negligible
Construction			
High	High risk	Medium risk	Low risk
Medium	Medium risk	Medium risk	Low risk

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
Low	Low risk	Low risk	Negligible
Trackout			
High	High risk	Medium risk	Low risk
Medium	Medium risk	Medium risk	Low risk
Low	Low risk	Low risk	Negligible

8.2.3.2 Traffic Assessment

Construction phase traffic also has the potential to impact air quality. The TII guidance *Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106* (TII, 2025a), 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. While the guidance is specific to infrastructure projects, the approach can be applied to any development that causes a change in traffic.

- ▶ Annual average daily traffic (AADT) changes by 1,000 or more;
- ▶ Heavy duty vehicle (HDV) AADT changes by 200 or more;
- ▶ Daily average speed change by 10 kph or more;
- ▶ Peak hour speed change by 20 kph or more;
- ▶ A change in road alignment by 5m or greater.

Punch Consulting Engineers have prepared a Traffic and Transport Impact Assessment for the Proposed Development enclosed separately and have prepared Chapter 13 Material Assets (Traffic and Transportation) of this EIAR. As per Chapter 13, it has been determined by Punch Consulting Engineers that the construction stage traffic will not increase by 1,000 AADT, or 200 HDV AADT, or that the development will not result in speed changes or changes in road alignment. Therefore, the traffic does not meet the above scoping criteria, and a detailed air quality assessment of construction stage traffic emissions is not required as there is no potential for significant impacts to air quality with respect with human or ecological receptors. The impact of construction traffic has been qualitatively assessed.

8.2.4 Operational Phase

The traffic does not meet the scoping criteria (Section 8.2.3.2), and a detailed air quality assessment of operational stage traffic emissions is not required as there is no potential for significant impacts to air quality with respect to human or ecological receptors.

8.2.5 Forecasting Methods and Difficulties Encountered

There were no forecasting difficulties encountered.

8.3 Receiving Environment

8.3.1 Meteorological Data

A key factor in assessing temporal and spatial variations in air quality are 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) (WHO, 2006). 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 PM₁₀, 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 actually increase at higher wind speeds. Thus, measured levels of PM_{10} will be a non-linear function of wind speed.

The nearest weather station collating detailed weather records is Shannon Airport meteorological station, which is located approximately 22 km west of the site. Shannon Airport met data has been examined to identify the prevailing wind direction and average wind speeds over a five-year period (Figure 8.1). For data collated during five representative years (2021 - 2025) (Met Éireann, 2026), the predominant wind direction is westerly to south-westerly; the mean wind speed over the long term 30-year averaging period 1991 - 2020 is 4.6 m/s (Met Éireann, 2025).

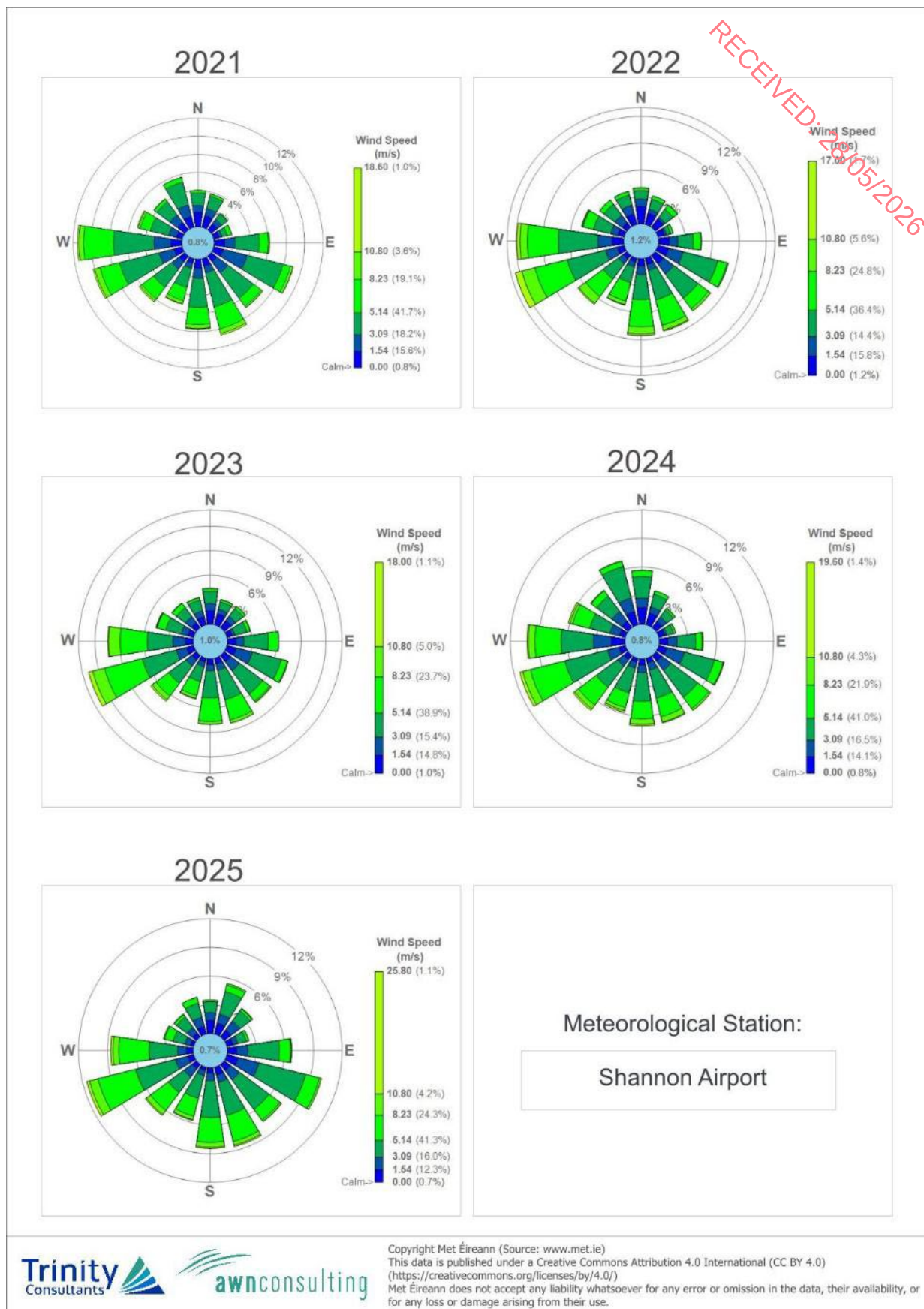


Figure 8.1: Wind Roses for Shannon Airport Meteorological Station

8.3.2 Baseline Air Quality

Air quality monitoring programs have been undertaken in recent years by the EPA. The most recent annual report on air quality in Ireland is "*Air Quality In Ireland 2024*" (EPA, 2025). 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, 2025).

As part of the implementation of the Air Quality Standards Regulations 2022 (S.I. No. 739 of 2022) four air quality zones have been defined in Ireland for air quality management and assessment purposes (EPA, 2025). Dublin is defined as Zone A and Cork as Zone B. Zone C is composed of 23 towns with a population of greater than 15,000. The remainder of the country, which represents rural Ireland but also includes all towns with a population of less than 15,000, is defined as Zone D.

In terms of air monitoring and assessment, the Proposed Development site is within Zone C (EPA, 2025). 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.).

8.3.2.1 NO₂

Long-term NO₂ monitoring was carried out at the Zone C suburban background locations of Dundalk, Kilkenny Seville Lodge and Portlaoise for the period 2020 – 2024 (EPA, 2025). Long term average concentrations are significantly below the annual average limit of 40 µg/m³ and the post-2030 limit value of 20 µg/m³. Average results range from 4 – 11 µg/m³ for the relevant background locations (Table 8.7). The 5-year average NO₂ concentration for all representative sites suggests an average concentration of 8 µg/m³ as a background concentration. Additionally, there was at most 1 exceedance (Dundalk) of the hourly limit value of 200 µg/m³ (in 2020, 2022 and 2023). Based on the above information, a conservative estimate of the current background NO₂ concentration for the region of the Proposed Development is 8 µg/m³.

Table 8.7 Background Air Quality - Nitrogen Dioxide (NO₂)

Station	Averaging Period	Year				
		2020	2021	2022	2023	2024
Dundalk	Annual Mean NO ₂ (µg/m ³)	10	11	10	9	10
	1-hr Mean NO ₂ Values >200 µg/m ³	1	0	1	1	0
Kilkenny Seville Lodge	Annual Mean NO ₂ (µg/m ³)	4	4	5	4	5
	1-hr Mean NO ₂ Values >200 µg/m ³	0	0	0	0	0
Portlaoise	Annual Mean NO ₂ (µg/m ³)	8	8	9	8	8
	1-hr Mean NO ₂ Values >200 µg/m ³	0	0	0	0	0

8.3.2.2 PM₁₀

Continuous PM₁₀ monitoring was carried out at the representative Zone C suburban locations from 2020 - 2024: Athlone, Carlow Town, Dundalk, Galway Ragoon, Kilkenny Seville Lodge, Portlaoise, Tralee and Wexford Town (Table 8.8).

Long-term PM₁₀ concentrations are in compliance with the current annual average limit value of 40 µg/m³ and the post-2030 limit value of 20 µg/m³.

Levels range from 10 - 18 $\mu\text{g}/\text{m}^3$ over the five-year period with at most 14 exceedances (in Tralee, 2022) of the 24-hour limit value of 50 $\mu\text{g}/\text{m}^3$ (35 exceedances are permitted per year) (EPA, 2025). The 5-year average PM_{10} concentration at the sites suggests an average concentration of no more than 13 $\mu\text{g}/\text{m}^3$ (Table 8.8). Based on the EPA data, a conservative estimate of the current background PM_{10} concentration in the region of the Proposed Development is 13 $\mu\text{g}/\text{m}^3$.

Table 8.8 Background Air Quality - PM_{10}

Station	Averaging Period	Year				
		2020	2021	2022	2023	2024
Athlone	Annual Mean PM_{10} ($\mu\text{g}/\text{m}^3$)	16	12	12	12	12
	24-hr Mean > 50 $\mu\text{g}/\text{m}^3$ (days)	3	2	3	1	-
Carlow Town	Annual Mean PM_{10} ($\mu\text{g}/\text{m}^3$)	11	10	11	10	11
	24-hr Mean > 50 $\mu\text{g}/\text{m}^3$ (days)	1	0	0	0	-
Dundalk	Annual Mean PM_{10} ($\mu\text{g}/\text{m}^3$)	13	12	12	13	12
	24-hr Mean > 50 $\mu\text{g}/\text{m}^3$ (days)	2	0	2	1	-
Galway Ragoon	Annual Mean PM_{10} ($\mu\text{g}/\text{m}^3$)	13	11	13	13	12
	24-hr Mean > 50 $\mu\text{g}/\text{m}^3$ (days)	1	1	0	0	-
Kilkenny Seville Lodge	Annual Mean PM_{10} ($\mu\text{g}/\text{m}^3$)	18	17	18	14	12
	24-hr Mean > 50 $\mu\text{g}/\text{m}^3$ (days)	1	2	2	0	-
Portlaoise	Annual Mean PM_{10} ($\mu\text{g}/\text{m}^3$)	12	11	12	11	12
	24-hr Mean > 50 $\mu\text{g}/\text{m}^3$ (days)	0	1	0	0	-
Tralee	Annual Mean PM_{10} ($\mu\text{g}/\text{m}^3$)	16	17	18	15	15
	24-hr Mean > 50 $\mu\text{g}/\text{m}^3$ (days)	7	11	14	2	-
Wexford Town	Annual Mean PM_{10} ($\mu\text{g}/\text{m}^3$)	12	14	15	13	13
	24-hr Mean > 50 $\mu\text{g}/\text{m}^3$ (days)	0	2	5	1	-

8.3.2.3 $\text{PM}_{2.5}$

Continuous $\text{PM}_{2.5}$ monitoring was carried out at the representative Zone C suburban background locations from 2020 - 2024: Athlone, Bray and Carlow Town (Table 8.9) Levels range from 5 - 13 $\mu\text{g}/\text{m}^3$ over the five-year period (EPA, 2025) which is in compliance with the current annual mean limit value of 25 $\mu\text{g}/\text{m}^3$ and the post-2030 limit value of 10 $\mu\text{g}/\text{m}^3$. Based on the EPA data, a conservative estimate of the current background $\text{PM}_{2.5}$ concentration in the region of the Proposed Development is 8 $\mu\text{g}/\text{m}^3$.

Table 8.9: Background Air Quality - $\text{PM}_{2.5}$

Station	Averaging Period	Year				
		2020	2021	2022	2023	2024
Athlone	Annual Mean $\text{PM}_{2.5}$ ($\mu\text{g}/\text{m}^3$)	12	9	9	8	9
Bray	Annual Mean $\text{PM}_{2.5}$ ($\mu\text{g}/\text{m}^3$)	5	6	6	6	6
Carlow Town	Annual Mean $\text{PM}_{2.5}$ ($\mu\text{g}/\text{m}^3$)	7	7	7	6	7

Station	Averaging Period	Year				
		2020	2021	2022	2023	2024
Portlaoise	Annual Mean PM _{2.5} (µg/m ³)	8	8	8	7	8
Tralee	Annual Mean PM _{2.5} (µg/m ³)	12	13	13	10	11

Based on the above information the air quality in the area is generally good, with concentrations of the key pollutants generally well below the relevant limit values.

8.3.2.4 Summary

Based on the above information the air quality in the Zone C area, including the Proposed Development is generally good, with concentrations of the key pollutants generally well below the relevant limit values set out in Table 2 of Annex I of Directive (EU) 2024/2881. The current pollutant concentrations at the majority of monitoring sites are also in compliance with the 2030 limit values set out in Table 1 of Annex I in Directive (EU) 2024/2881 and the clean air strategy, however, concentrations are approaching the limit values at some sites. Further measures will be needed at a national scale to reduce air pollution in future years. The EPA have indicated that road transport emissions are contributing to increased levels of NO₂ with the potential for breaches in the annual NO₂ limit value in future years at locations within urban centres and roadside locations. In addition, burning of solid fuels for home heating is contributing to increased levels of particulate matter (PM₁₀ and PM_{2.5}). The EPA predict that exceedances in the particulate matter limit values are likely in future years if burning of solid fuels for residential heating continues (EPA, 2025).

8.3.3 Sensitivity of the Receiving Environment to Dust

The impact to air quality from construction phase activities is assessed at sensitive receptors within 250 m of the development boundary.

In terms of receptor sensitivity to dust soiling, there are between 10 and 100 sensitive receptors within 20 m of the proposed works area and a further >100 sensitive receptors within 250 m of the Proposed Development (Figure 8.2).

The IAQM guidelines also outline the assessment criteria for determining the sensitivity of the area to dust-related ecological impacts. Dust from construction sites deposited on vegetation may create ecological stress within the local plant community. The guidance states that dust impacts to vegetation can occur up to 50 m from the site and 50 m from site access roads, up to 250 m for the site entrance. There are no internationally designated sites (Special Areas of Conservation (SACs) and Special Protection Areas (SPAs), (hereafter referred to as 'European sites') or nationally designated sites (Natural Heritage Areas (NHAs) located within this distance. Therefore, ecological impacts will not be considered further in the dust assessment.

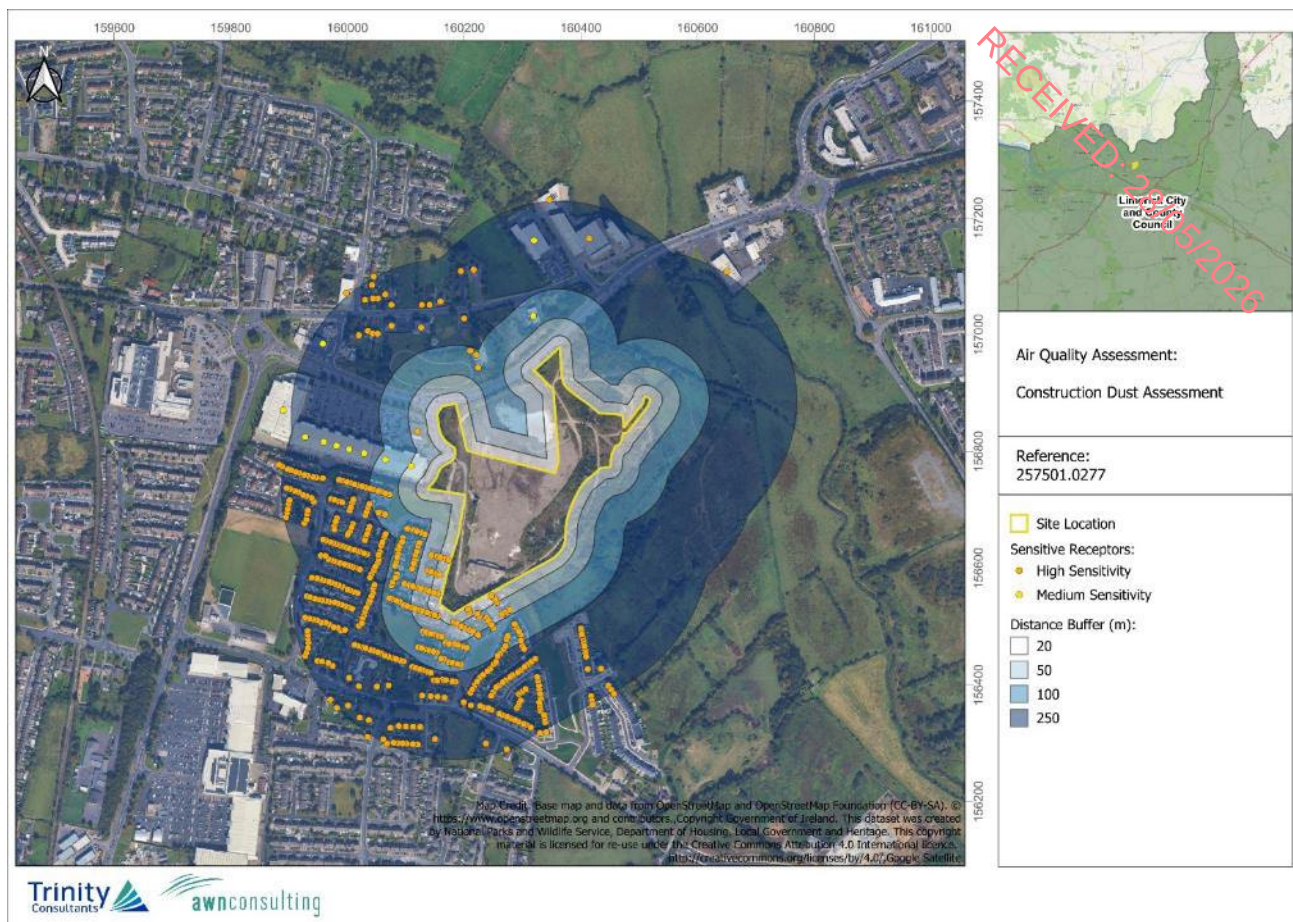


Figure 8.2: Construction Dust Sensitive Receptors within 250 m of Site

8.4 Characteristics of the Proposed Development

The development consists of a mix of residential, community, and healthcare uses supported by new site infrastructure. The scheme includes a medical centre of approximately 3082 m² located at the western extent of the site, along with a 306 m² crèche at lower ground floor level within Block B. The residential component will provide a total of 403 units across 5 no. blocks, comprising 246 one-bedroom units, 29 two-bedroom (3-person) units, and 128 two-bedroom (4-person) units. To support the development, a new entrance from the R445 is proposed, together with nature-based surface water drainage solutions within the neighbouring Groody Valley green wedge.

Chapter 2 provides a detailed overview of the lifecycle of the project, including reference to the architectural and civil engineering, drawings, plans, reports, and other relevant document in order to define the Proposed Development.

8.4.1 Construction Phase

During the construction phase construction dust emission have the potential to impact air quality. Dust emissions will primarily occur as a result of site preparation works, earthworks and the movement of trucks on site and exiting the site. There is also the potential for engine emissions from site vehicles and machinery to impact air quality. Construction phase impacts will be short-term in duration.

8.4.2 Operational Phase

Engine emissions from vehicles accessing the site have the potential to impact air quality during the operational phase of the development through the release of nitrogen dioxide (NO₂) and particulate matter (as PM₁₀ and PM_{2.5}). However, the Proposed Development will not increase traffic by 1,000 AADT or 200 HDV AADT. Operational phase impacts will be long-term in duration.

8.5 Potential Impacts of the Proposed Development

8.5.1 Construction Phase

8.5.1.1 Construction Dust Assessment

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. While construction dust tends to be deposited within 250 m of a construction site, the majority of the deposition occurs within the first 50 m (IAQM, 2024). The extent of any dust generation depends on the nature of the dust (soils, peat, sands, gravels, silts etc.) and the nature of the construction activity. In addition, the potential for dust dispersion and deposition depends on local meteorological factors such as rainfall, wind speed and wind direction. A review of Shannon Airport meteorological data indicates that the prevailing wind direction is westerly to south-westerly and wind speeds are generally moderate in nature (Section 8.3.1). Dust impacts are likely to occur during drier periods, as rainfall acts as a natural dust suppressant (IAQM, 2024). Days with less than 0.2mm of rainfall can be classified as days with little or no rainfall. A review of historical 30-year average data for Shannon Airport indicates that on average 223 days per year have rainfall over 0.2 mm (Met Éireann, 2026a). Therefore, it can be determined that over 61% of the time dust generation will be reduced due to natural meteorological conditions.

To determine the level of dust mitigation required during the proposed works, the potential dust emission magnitude for each dust generating activity needs to be taken into account, in conjunction with the sensitivity of the area (Section 8.3.3). The major dust generating activities are divided into four types within the IAQM guidance (IAQM, 2024) to reflect their different potential impacts. These are: demolition, earthworks, construction and trackout (construction vehicles on public roads).

8.5.1.2 Determining the Potential Dust Emission Magnitude

The magnitude of the works under each category can be classified as either small, medium or large depending on the scale of the works involved. The magnitude of each activity (Table 8.10) has been determined below for the Proposed Development using the criteria in Table 8.4.

Table 8.10: Potential Dust Emission Magnitude

Activity	Dust Emission Magnitude	Justification
Demolition	Small	Total building volume to be demolished will be less than 12,000 m ³
Earthworks	Medium	Total site area is between 18,000 m ² and 110,000 m ²
Construction	Large	Total building volume will be greater than 75,000 m ³
Trackout	Medium	Between 20 and 50 outward HDV movements per day

8.5.1.3 Determining the Sensitivity of the Area

As determined in Section 8.3.3, there are between 10 and 100 high sensitivity receptors within 20 m of the proposed works area and >100 high sensitivity receptors within 250 m. There are no European sites

or nationally designated sites within 50 m of the Site boundary. Based on the IAQM criteria outlined in Table 8.5, the sensitivity of the area to dust soiling is considered high.

In addition to sensitivity to dust soiling, the IAQM guidelines also outline the assessment criteria for determining the sensitivity of the area to human health impacts. The criteria take into consideration the current annual mean PM₁₀ concentration, receptor sensitivity based on type (residential receptors are classified as high sensitivity) and the number of receptors affected within various distance bands from the construction works. A conservative estimate of the current annual mean PM₁₀ concentration in the vicinity of the Proposed Development is 13 µg/m³ and there are between 10 and 100 sensitive receptors within 20 m of the site boundary. Based on the IAQM criteria outlined in Table 8.5, the worst-case sensitivity of the area to human health is considered low.

The sensitivity of the area to dust soiling and human health impacts from dust are shown in Table 8.11.

Table 8.11: Sensitivity of the Area

Potential Impact	Sensitivity of the Surrounding Area			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	High	High	High	High
Human Health	Low	Low	Low	Low

8.5.1.4 Determining the Risk of Dust Impacts

As detailed in Table 8.6, The predicted dust emission magnitude has been combined with the defined sensitivity of the area to determine the risk of impacts during the construction phase, prior to mitigation.

Table 8.12 below provides a summary of the risk of dust impacts for the Proposed Development.

There is at most a high risk of dust soiling impacts based on the high sensitivity of the surrounding area to dust soiling and, at most, large dust emissions magnitude. There is a low risk of dust-related human health impacts associated with the proposed works based on the low sensitivity of the area to human health impacts and the large dust emission magnitude. Without mitigation in place, construction dust will have a **direct, negative, short-term** and **slight** impact on air quality, which has the potential to be **significant**. As a result, best practice dust mitigation measures associated with high-risk works will be implemented to ensure there are no significant impacts at nearby sensitive receptors (see Section 8.3.3).

Table 8.12: Risk of Dust Impacts used to Define Site-Specific Mitigation

Potential Impact	Risk of Dust Impacts			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Medium Risk	Medium Risk	High Risk	Medium Risk
Human Health	Negligible Risk	Low Risk	Low Risk	Low Risk

8.5.1.5 Construction Phase Traffic

There is also the potential for traffic emissions to impact air quality in the short term over the construction phase. Particularly due to the increase in HGVs accessing the site. The construction stage traffic has been reviewed, and a detailed air quality assessment has been scoped out as none of the road links impacted by the Proposed Development satisfy the TII assessment criteria in Section 8.2.3.2.

Following the completion of the initial site clearance works, the generation of HGV movements during the build period will be evenly spread throughout the day and, as such, will not impact significantly during the peak traffic periods.

It can therefore be determined that the construction stage traffic will have a ***negative, short-term, localised*** and ***not significant*** impact on air quality.

8.5.2 Operational Phase

There is the potential for vehicles accessing the site to result in emissions of NO₂, PM₁₀ and PM_{2.5}. However, the Proposed Development will not increase traffic by 1,000 AADT or 200 HDV AADT. In addition, there are no proposed changes to the traffic speeds or road alignment. Therefore, no road links impacted by the Proposed Development satisfy the screening criteria (Section 13.4.3.2). A detailed air quality assessment was scoped out for the operational stage of the development as per the TII screening criteria. The potential operational stage effects on air quality will be ***neutral, long-term*** and ***imperceptible***.

8.6 Mitigation Measures

8.6.1 Construction Phase

Based on the assessment results in Section 8.5.1, mitigation associated with a high-risk of construction dust impacts is required. Mitigation measures for high-risk sites as recommended by IAQM construction dust guidance are detailed in Table 8.13.

Table 8.13: Construction Phase Dust Mitigation Measures

Category	Mitigation Measure
Communications	- Develop and implement a stakeholder communications plan that includes community engagement before work commences on site. - Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager. - Display the head or regional office contact information.
Site Management	- 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. - Hold regular liaison meetings with other high risk construction sites within 500 m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport/deliveries which might be using the same strategic road network routes.

Category	Mitigation Measure
Preparing and Maintaining the Site	• Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible. • Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site. • Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period • Avoid site runoff of water or mud. • Keep site fencing, barriers and scaffolding clean using wet methods. • Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below. • Cover, seed or fence stockpiles to prevent wind whipping.
Operating vehicle/machinery and sustainable travel	• Ensure all vehicles switch off engines when stationary – no idling vehicles. • Impose and signpost a maximum-speed-limit of 25 kmph on surfaced and 15 kmph on unsurfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate) • Produce and implement a Construction Transport Management Plan (CTMP) to manage the sustainable delivery of goods and materials. • The CTMP should also support and encourage sustainable travel (public transport, cycling, walking, and car-sharing)
Operations	• Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems • Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate • Use enclosed chutes and conveyors and covered skips. • Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate. • Ensure equipment is readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.
Waste management	• Bonfires and burning of waste materials are legally prohibited.
Measures Specific to Demolition	• Ensure effective water suppression is used during demolition operations. Handheld sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition, high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground. • Avoid explosive blasting, using appropriate manual or mechanical alternatives. • Bag and remove any biological debris or damp down such material before demolition.

Category	Mitigation Measure
Measures Specific to Construction	• Avoid scabbling (roughening of concrete surfaces) if possible. • Ensure sand and other aggregates are stored in banded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place. • Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery. • For smaller supplies of fine powder materials, ensure bags are sealed after use and stored appropriately to prevent dust.
Measures Specific to Trackout	• Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use. • Avoid dry sweeping of large areas. • Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport. • Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable. • Record all inspections of haul routes and any subsequent action in a site log book. • Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned. • Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable). • Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits. • Access gates to be located at least 10 m from receptors where possible.

8.6.2 Operational Phase

The impact of the operational traffic associated with Proposed Development on air quality is predicted to be *imperceptible* with respect to the operational phase in the long term. Therefore, no site-specific mitigation measures are required.

8.7 Monitoring or Reinstatement Measures

8.7.1 Construction Phase

Monitoring of construction dust deposition along the site boundary to nearby sensitive receptors 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 2 m above ground level. The TA Luft limit value is 350 mg/m²/day during the monitoring period of 30 days (+/- 2 days).

8.7.2 Operational Phase

There is no monitoring recommended for the operational phase of the Proposed Development as impacts to air quality are predicted to be *imperceptible*.

8.8 Residual Effects of the Proposed Development

8.8.1 Construction Phase

8.8.1.1 Air Quality

Once the dust mitigation measures outlined in Section 8.6.1 are implemented, the residual effect of the Proposed Development in terms of dust soiling will be *short-term, negative, localised* and *not significant* at nearby receptors.

8.8.1.2 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 residual effect of construction of the Proposed Development will be *short-term, negative, localised* and *not significant* with respect to human health.

8.8.2 Operational Phase

As no mitigation is proposed, the operational phase residual effect on air quality and human health as a result of increased traffic is *long-term, neutral* and *imperceptible*.

8.9 Cumulative Effects of the Proposed Development

8.9.1 Construction Phase

According to the IAQM guidance (2024) should the construction phase of the Proposed Development coincide with the construction phase of any other developments within 500 m then there is the potential for cumulative construction dust related effects at nearby sensitive receptors. Table 8.14 lists the developments identified as sufficient in scale to potentially generative cumulative effects with the Proposed Development.

Table 8.14: Summary of Committed Developments with Potential for Cumulative Construction Dust Effects

Planning Reference No.	Description
2560113 (Limerick County Council)	A Large-Scale Residential Development (LRD) - development of a Purpose-Built Student Accommodation (PBSA) scheme on land fronting the Groody Road and Dublin Road, Castletroy, in the townland of Newcastle, Limerick for a period of seven years.
221216 (Limerick County Council)	Large-Scale Residential Development (LRD) on lands (0.53 Ha) at Old Dublin Road, Rhebogue, Limerick City. The development comprises of the construction of a Purpose-Built Student Accommodation (PBSA) scheme consisting of 26 no. apartments with a total of 202 no. student bedspaces distributed across 3 No. multi storey blocks.

The dust mitigation measures outlined in Section 8.6.1 will be applied during the construction phase which will avoid significant cumulative effects on air quality. Similar dust mitigation measures are required for other permitted developments as per their respective impact assessments and planning conditions.

With appropriate mitigation measures in place, the predicted cumulative impacts on air quality associated with the construction phase of the Proposed Development and the aforementioned developments are deemed ***short-term, negative, localised*** and ***not significant***.

8.9.1.1 Operational Phase

The cumulative effect is included within the operational stage traffic assessment for the Proposed Development. The effect is predicted to be ***long-term, direct, neutral*** and ***imperceptible*** with regards to air quality.

8.10 Conclusion

This chapter has reviewed and analysed the potential and the predicted impacts of the Proposed Development with regards to air quality. These impacts have been considered for both the construction and operational phases of the Proposed Development. The cumulative impact of the Proposed Development and surrounding developments have also been considered.

Provided all mitigation measures are followed as set out in this chapter, the overall predicted air quality effect of the Proposed Development is ***not significant***.

8.11 References

- ▶ Environmental Protection Agency (2006) Environmental Management Guidelines - Environmental Management in the Extractive Industry (Non-Scheduled Minerals)
- ▶ Environmental Protection Agency (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports
- ▶ Environmental Protection Agency (2025) Air Quality in Ireland 2024 (& previous annual reports 2020-2023)
- ▶ German VDI (2002) Technical Guidelines on Air Quality Control – TA Luft
- ▶ Government of Ireland (2023) Clean Air Strategy for Ireland
- ▶ Institute of Air Quality Management (IAQM) (2020) A Guide To The Assessment Of Air Quality Impacts On Designated Nature Conservation Sites (Version 1.1)
- ▶ Institute of Air Quality Management (IAQM) (2024) Guidance on the Assessment of Dust from Demolition and Construction (Version 2.2)
- ▶ Met Éireann (2025) Ireland's 30-year Climate Averages
- ▶ Met Éireann (2026) Met Éireann website: <https://www.met.ie/>
- ▶ Transport Infrastructure Ireland (2025a) Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106
- ▶ Transport Infrastructure Ireland (2025b) TII Road Emissions Model (REM): Model Development Report – GE-ENV-01107
- ▶ World Health Organisation (2021) Air Quality Guidelines (and previous Air Quality Guideline Reports 1999 & 2000 & 2006)



RECEIVED: 28/05/2026

Chapter 9 – Climate

TABLE OF CONTENTS

9. CLIMATE	9-1
9.1 Introduction.....	9-1
9.2 Assessment Methodology.....	9-1
9.2.1 Legislation, Policy and Guidance	9-1
9.2.2 Local policy	9-5
9.2.3 Greenhouse Gas Assessment.....	9-6
9.2.4 Climate Change Risk Assessment.....	9-10
9.3 Receiving Environment	9-11
9.3.1 Current GHG Baseline.....	9-11
9.3.2 Future GHG Baseline	9-12
9.3.3 Current CCRA Baseline.....	9-13
9.3.4 Future CCRA Baseline.....	9-16
9.4 Characteristics of the Proposed Development.....	9-18
9.4.1 Proposed Development Overview.....	9-18
9.4.2 Construction Stage.....	9-18
9.4.3 Operational Stage	9-18
9.5 Potential Impact of the Proposed Development.....	9-18
9.5.1 Greenhouse Gas Assessment.....	9-18
9.5.2 Climate Change Risk Assessment.....	9-21
9.5.3 Do-Nothing Impact.....	9-24
9.6 GHG Mitigation Measures.....	9-24
9.6.1 Construction Stage.....	9-24
9.6.2 Operational Stage	9-25
9.7 CCRA Mitigation Measures	9-26
9.7.1 Construction Stage.....	9-26
9.7.2 Operational Stage	9-26
9.7.3 Extreme Wind.....	9-27
9.8 Monitoring	9-28
9.9 Residual Effects of the Proposed Development.....	9-28
9.9.1 GHG Residual Effects.....	9-28
9.9.2 CCRA Residual Effects	9-29
9.10 Cumulative Impacts of the Proposed Development	9-29
9.11 Section 15 Compliance.....	9-30
9.12 References	9-31

LIST OF TABLES

Table 9-1: Carbon Budgets for the CAP25 5-Year Periods	9-3
Table 9-2 CAP25 Sectoral Emission Ceilings for 2030	9-3
Table 9-3: TII Significance Criteria for Greenhouse Gas Assessment	9-9
Table 9-4: Vulnerability Matrix	9-11
Table 9-5: Trends in Total National GHG Emissions 2021 – 2024	9-12
Table 9-6: Physical Climate Hazard Screening	9-13
Table 9-7: Predicted future climate hazards across RCP4.5 and RCP8.5 up to 2100	9-17
Table 9-8: GHG Construction Phase Assessment Results	9-19
Table 9-9: GHGA Operational Phase Assessment Results across the lifespan of the Proposed Development	9-20
Table 9-10: Estimated GHG Emissions Relative to Sectoral Budgets and GHG Baseline	9-20
Table 9-11: Receptors and their sensitivity to climate hazards	9-21
Table 9-12: Exposure of Proposed Development to the climate hazards	9-22
Table 9-13: Vulnerability of the Proposed Development to the risks of climate change impacts	9-23

LIST OF FIGURES

Figure 9-1 Future Climate Risk Matrix reproduced from LCC Climate Action Plan 2024-2029	9-5
Figure 9.2: Climate Averages for Limerick, Ireland, for the period 1991-2020	9-15

RECEIVED: 28/05/2026

9. CLIMATE

9.1 Introduction

This chapter assesses the likely climate impacts associated with the Proposed Development. A full description of the development is available in Chapter 2 (Description of the Proposed Development).

The climate assessment is divided into two distinct sections:

- ▶ The Greenhouse Gas Emissions Assessment (GHGA) – Quantifies the greenhouse gas (GHG) emissions from a project over its lifetime. The assessment compares these emissions to relevant carbon budgets, targets and policy to contextualise magnitude.
- ▶ The Climate Change Risk Assessment (CCRA) – Identifies the impact of a changing climate on a project and receiving environment. The assessment considers a project's vulnerability to climate change and identifies adaptation measures to increase project resilience.

9.2 Assessment Methodology

9.2.1 Legislation, Policy and Guidance

In common with all environmental legislation, in Ireland climate legislation is driven primarily by international agreements or European Directives that are then transcribed into domestic law by the Government of Ireland. This is then interpreted through European and domestic policy instruments that clarify aspects, objectives, targets and requirements described in the legislation.

9.2.1.1 Legislation

The **United Nations Paris Agreement** (United Nations, 2015) treaty binds signatory nations to a commitment to hold global average temperature increase well below 2°C above pre-industrial levels with efforts to limit the increase to 1.5°C below pre-industrial levels. Signatories commit to Nationally Determined Contributions (NDCs) which are self-defined climate pledges made by countries in response to climate change, which also includes the direction of finance. Adaptation to the adverse impacts of climate change and lowering greenhouse gas emissions should be undertaken in an equitable manner so as not to disadvantage populations on lower incomes or those most at risk from climate change.

Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999 (European Parliament and Council, 2021) follows from the Paris Agreement and writes into EU law the goal set out in the European Green Deal for Europe's economy and society to become climate-neutral by 2050. The law also sets the intermediate target of reducing net greenhouse gas (GHG) emissions by at least 55% by 2030, compared to 1990 levels. These targets are also applied to member states.

Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment (European Parliament and Council, 2014) acknowledges that climate change will play a crucial role in the sustainable development of society. Directive 2014/52/EU requires assessment of the impact of specific types of new development on the climate. There is a requirement for the quantification of greenhouse gases from a development, and an assessment of the risk posed to specific types of new development by the adverse effects of climate change.

The **Climate Action and Low Carbon Development Act 2015** (Government of Ireland, 2015) enables Ireland 'to pursue, and achieve, the transition to a low carbon, climate resilient and environmentally

sustainable economy by the end of the year 2050. This is referred to in the 2015 Act (as amended) as the '*national transition objective*'. The 2015 Act (as amended) made provision for a national mitigation plan, and a national adaptation framework. In addition, the Act provided for the establishment of the Climate Change Advisory Council with the function to advise and make recommendations on the preparation of the national mitigation and adaptation plans and compliance with existing climate obligations.

Section 15 of the 2015 Act, sets out the duties imposed by certain bodies, including local authorities and *An Coimisiún Pleanála*. This section was amended by the 2021 Act and states:

"(1) A relevant body shall, in so far as practicable, perform its functions in a manner consistent with—
(a) the most recent approved climate action plan,
(b) the most recent approved national long term climate action strategy,
(c) the most recent approved national adaptation framework and approved sectoral adaptation plans,
(d) the furtherance of the national climate objective, and
(e) the objective of mitigating greenhouse gas emissions and adapting to the effects of climate change in the State."

The **Climate Action and Low Carbon Development (Amendment) Act 2021** (Government of Ireland, 2021) provides the framework for Ireland to achieve a climate resilient and climate neutral economy by the end of the year 2050. The Act allows for the setting of carbon budgets and sectoral emissions ceilings to apply to sectors of the economy whilst promoting climate justice and just transition to the climate resilient and climate neutral economy. Carbon budgets are determined based on the requirements for reductions in GHG described in *EU Regulation 2018/842* and *EU Regulation 2018/842*. The Climate Action and Low Carbon Development (Amendment) Act 2021 should be read together with the Climate Action and Low Carbon Development Act 2015, and together are referred to in this report as the "Climate Act".

9.2.1.2 Policy

The **European Green Deal** published by the European Commission in December 2019, provides an action plan which aims for the EU to achieve climate neutrality by 2050. The EU Green Deal highlights a reduction in emissions of 55% in comparison to 1990 levels by 2030 and 90% by 2040. The deal outlines plans for a just and fair transition to a climate neutral society through funding and social investment, carbon pricing, the Emissions Trading Scheme, green industry, the circular economy and stakeholder engagement in the processes at every level.

The **2021 EU Strategy on Adaptation to Climate Change** (European Commission, 2021a) sets out the pathway to prepare for the unavoidable impacts of climate change. The aim is that "by 2050, when we aim to have reached climate neutrality, we will have reinforced adaptive capacity and minimised vulnerability to climate impacts..."

The latest iteration of the Government of Ireland's **Climate Action Plan** (CAP25) (Government of Ireland, 2025a) was published in 2025 updating many of the suggested measures and actions required to achieve carbon budgets and sectoral emissions ceilings from CAP24, (Government of Ireland, 2024a). Both CAP24 and CAP25 should be read together. The plans taken together provide the roadmap for halving Ireland's emissions by 2030 and achieving carbon neutrality by 2050. The CAP25 advances sector-specific measures including decarbonising the residential building sector. This includes the complete phase-out of fossil fuel heating for both new builds and retrofits. CAP25 details the 5-year carbon budget periods, shown in Table 10.1, and the Sectoral Emissions Ceilings, shown in Table 10.2, as required by the Climate Act.

Table 9-1: Carbon Budgets for the CAP25 5-Year Periods

Budget Period	Carbon Budget	Reduction Required
2021-2025	295 Mt CO ₂ e	Reduction in emissions of 4.8% per annum for the first budget period.
2026-2030	200 Mt CO ₂ e	Reduction in emissions of 8.3% per annum for the second budget period.
2031-2035	151 Mt CO ₂ e	Reduction in emissions of 3.5% per annum for the third provisional budget.

Table 9-2 CAP25 Sectoral Emission Ceilings for 2030

Sector	Baseline (Mt CO ₂ e) 2018	Carbon Budgets (Mt CO ₂ e)		2030 Emissions (Mt CO ₂ e)	Indicative Emissions % Reduction in Final Year of 2025- 2030 Period (Compared to 2018)
		2021- 2025	2026- 2030		
Electricity	10	40	20	3	75
Transport	12	54	37	6	50
Built Environment - Residential	7	29	23	4	40
Built Environment - Commercial	2	7	5	1	45
Industry	7	30	24	4	35
Agriculture	23	106	96	17.25	25
Other (F-gases, waste, petroleum refining)	2	9	8	1	50
Land Use, Land- use Change and Forestry (LULUCF)	5	Reflecting the continued volatility for LULUCF baseline emissions to 2030 and beyond, a new approach aligned with the EU LULUCF Regulation has been adopted.			
Total	68				
Unallocated Savings	-	-	26	-5.25	-
Legally Binding Carbon Budgets and 2030 Emission Reduction Targets	-	295	200	-	51

The **Long-Term Strategy on Greenhouse Gas Emissions Reductions** (Government of Ireland, 2023) provides the indicative pathways beyond 2030 on how Ireland will transition towards carbon neutrality by 2050. The strategy is intended to bridge the gap between the short-term objectives of the Climate Action Plans and the longer-term objectives of EU Climate Law and Ireland's National Climate Objective.

The **National Planning Framework (First Revision)** (Government of Ireland, 2025b) specifies policies relevant for the Proposed Development:

- National Policy Objective 66: The planning system will be responsive to our national environmental challenges and ensure that development occurs within environmental limits, having regard to the

medium and longer-term requirements of all relevant environmental and climate legislation and the sustainable management of our natural capital.

- ▶ National Policy Objective 69: Reduce our carbon footprint by integrating climate action into the planning system in support of national targets for climate policy mitigation and adaptation objectives, as well as targets for greenhouse gas emissions reductions as expressed in the most recently adopted carbon budgets
- ▶ National Policy Objective 82: Integrated planning for Green and Blue Infrastructure will be incorporated into the preparation of statutory land use plans while maintaining ecosystem services and ecosystem functions and conserving and/or restoring biodiversity.
- ▶ National Policy Objective 93: Improve air quality and help prevent people being exposed to unacceptable levels of pollution in our urban and rural areas through integrated land use and spatial planning that supports public transport, walking and cycling as more favourable modes of transport to the private car, the promotion of energy efficient buildings and homes, heating systems with zero local emissions, green and blue infrastructure planning and innovative design solutions

9.2.1.3 Climate Change Vulnerability Policy

The **Second National Adaptation Framework** (NAF) (Government of Ireland, 2024b) outlines a comprehensive, whole-of-government and whole-of-society approach to climate adaptation. Its core objective is to enhance Ireland's resilience to a wide range of climate risks, including extreme weather events, flooding, drought, biodiversity loss, sea level rise, and rising temperatures. The NAF sets out the roles of the Taoiseach, Government and non-governmental organisations, incorporates an evidence base for climate change and incorporates sectoral and local requirements and indicators for adaptation planning. In relation to the built environment, the NAF states in Chapter 3, "deepening of adaptation considerations in the planning and building standards processes is considered the most appropriate way of increasing the resilience of the built environment". Within the NAF it mentions that there is a risk of damage to buildings and structures from severe weather events such as high winds and intense rainfall. New development should accommodate predicted future climate change impacts without requiring major redesign or redevelopment in the future, which may be costly and inefficient. This will require facilitating innovative building design, new materials and standards (to accommodate hotter summers while withstanding changes in precipitation patterns and more intense storms for example).

The **National Climate Change Risk Assessment** (NCCRA) (Environmental Protection Agency, 2025) was required as part of the 2021 CAP. The NCCRA approached the risk assessment though:

- ▶ **Hazard** - the potential occurrence of a natural or human-induced physical event or trend or physical impact that may cause loss of life, injury, or other health impacts, as well as damage and loss to property, infrastructure, livelihoods, service provision, ecosystems, and environmental resources
- ▶ **Exposure** - the presence of people, livelihoods, species or ecosystems, environmental functions, services, and resources, infrastructure, or economic, social, or cultural assets in places and settings that could be adversely affected
- ▶ **Sensitivity** - refers to the degree to which a system or asset is affected by climate hazards. It reflects how vulnerable something is to changes such as temperature extremes, flooding, or drought, based on its physical, functional, or ecological characteristics
- ▶ **Vulnerability** - the propensity or predisposition to be adversely affected. Vulnerability encompasses a variety of concepts including sensitivity
- ▶ **Risk** - the potential for adverse consequences for human or ecological systems

Compilation of the NCCRA was undertaken using scenarios from the fifth Intergovernmental Panel on Climate Change Assessment Report (AR5). The NCCRA used a high concentration scenario resulting a predicted average global temperature increase of 4.3°C by 2100 (RCP8.5) generally accepted as an extreme worst-case scenario, and a moderate scenario (RCP4.5) where emissions are predicted to peak

by 2040 and then decline resulting in an average global temperature increase of between 2.5°C and 3°C. Both scenarios are considered conservative for Ireland as they assume that emissions targets are not met.

9.2.2 Local policy

The Limerick City and County Council Climate Action Plan 2024–2029 (LCCC, 2024) outlines the council's strategic approach to climate mitigation and adaptation, aiming to reduce greenhouse gas (GHG) emissions by 51% by 2030 (from a 2018 baseline) and to achieve climate neutrality by 2050. The plan is structured around a place-based approach, aligning with national and EU climate objectives, and is designed to support a just transition for communities across Limerick.

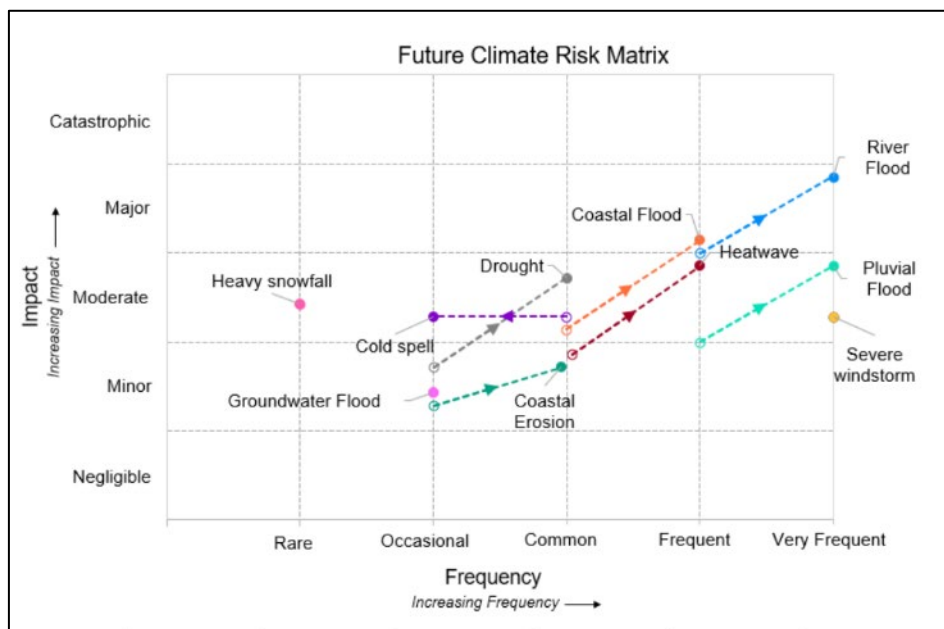
The plan is built on five key thematic areas:

- ▶ Buildings and Energy
- ▶ Transport
- ▶ Environment and Nature-Based Solutions
- ▶ Flood Resilience
- ▶ Circular Economy and Resource Management

Strategic vision of LCC– “A Green City Region on the Waterfront By 2030, Limerick will become a green City region on the Shannon Estuary connected through people and places. This will be achieved through engagement, innovation, resilient urban development and self-sustaining rural communities”.

The plan also includes a Climate Change Risk Assessment, which identifies key hazards for Limerick, including increased frequency of heavy rainfall, flooding, heatwaves, and droughts. The risk matrix below shows the future change in risk with the hollow marker showing the current risk and the solid marker the future risk. The dotted line shows the change between the current and future risk.

Figure 9-1 Future Climate Risk Matrix reproduced from LCC Climate Action Plan 2024-2029



The risk of existing hazards such as river, pluvial, and coastal flooding and coastal erosion is projected to increase in the future because of projected increases in the frequency of heavy precipitation events and rising sea levels. Heatwaves and droughts, although already experienced in Limerick City and County, are expected to occur more frequently due to climate change. These hazards can therefore be considered as resulting in emerging risks for the region. Although the frequency and impact of severe windstorms is

thought to be unchanged in the future, these events will remain a risk for Limerick City and County. The level of impact associated with cold spells for Limerick City and County remains constant, however, due to the potential decrease in hazard frequency, the overall risk of these hazards is likely to reduce in the future, resulting in a lesser risk.

9.2.2.1 Guidance

The following guidance is considered relevant to this assessment:

- ▶ Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (hereafter referred to as the EPA Guidelines) (Environmental Protection Agency, 2022)
- ▶ Environmental Impact Assessment of Projects – Guidance on the Preparation of the Environmental Impact Assessment Report (hereafter referred to as the EU Guidance) (European Commission, 2017)
- ▶ Transport Infrastructure Ireland (TII) PE-ENV-01104: Climate Guidance for National Roads, Light Rail and Rural Cycleways (Offline & Greenways) – Overarching Technical Document (Transport Infrastructure Ireland, 2022);
- ▶ Transport Infrastructure Ireland (TII) GE-ENV-01106: TII Carbon Assessment Tool for Road and Light Rail Projects and User Guidance Document (Transport Infrastructure Ireland, 2025)
- ▶ Institute of Sustainability and Environmental Professionals (ISEP) (formerly known as Institute of Environmental Management & Assessment (IEMA)) Environmental Impact Assessment Guide to: Assessing GHG Emissions and Evaluating their Significance (hereafter referred to as the ISEP 2026 GHG Guidance) (Institute of Sustainability & Environmental Professionals, 2026);
- ▶ ISEP Environmental Impact Assessment Guide to: Climate Change Resilience and Adaptation (hereafter referred to as the ISEP 2020 EIA Guide) (Institute of Sustainability & Environmental Practitioners, 2020a)
- ▶ ISEP GHG Management Hierarchy (hereafter referred to as the ISEP 2020 GHG Management Hierarchy) (Institute of Sustainability & Environmental Practitioners, 2020b)
- ▶ Carbon Management in Infrastructure and Built Environment - PAS 2080 (The British Standards Institution, 2023)
- ▶ Technical Guidance on the Climate Proofing of Infrastructure in the Period 2021-2027 (European Commission, 2021b)

9.2.3 Greenhouse Gas Assessment

9.2.3.1 Construction Phase

The assessment of GHG emissions resulting from the construction phase is quantified using the categories described in BS EN 15978. These are:

▶ **Product Stages (Category A1 to A3)**

The carbon emissions generated at this stage arise from extracting the raw materials from the ground, their transport to a point of manufacture and then the primary energy used (and associated carbon impacts that arise) from transforming the raw materials into construction products.

▶ **Construction (Category A4 to A5)**

These carbon impacts arise from transporting the construction products to site, and their subsequent processing and assembly into the building. Construction activities such as excavation works and construction transport are also included.

▶ **Use Stage (Category B1 to B7)**

This covers a wide range of sources from the GHG emissions associated with the operation of the building (B1), maintenance (B2), repair (B3), refurbishment (B4) and replacement (B5) of materials, and operational energy use (B6) and water use (B7).

End of Life Stages (Category C1 to C4)

- ▶ The eventual deconstruction and disposal of the existing building at the end of its life takes account of the on-site activities of the demolition contractors. No “credit” is taken for any future carbon benefit associated with the reuse or recycling of a material into new products.

PE-ENV-01104 (Transport Infrastructure Ireland, 2022) recommends the calculation of the construction stage embodied carbon using the TII Online Carbon Tool or an appropriate alternative tool. Embodied carbon refers to the sum of the carbon needed to produce a good or service. It incorporates the energy needed in the mining or processing of raw materials, the manufacturing of products and the delivery of these products to site. The purpose of the embodied carbon assessment is to engage the design team in the consideration of embodied carbon at an early stage in the development and mitigate embodied carbon. This engagement aims to ensure carbon savings are made and to assist in aligning the project to Ireland’s CAP25 goal of achieving carbon neutrality by 2050.

The TII Online Carbon Tool has been commissioned by TII to assess GHG emissions associated with road or rail projects in Ireland. The TII Carbon Tool uses emission factors from recognised sources including, but not limited to:

- ▶ Civil Engineering Standard Method of Measurement (CESSM) Carbon and Price Book database
- ▶ Circular Ecology ICE v4.0 ICE DB Advanced V4.0

The tool can be applied to a variety of developments, not just road or rail and aligns with PAS 2080. The TII Carbon Tool was utilised to estimate the GHG emissions associated with the non-building elements of the Proposed Development including construction activities, land clearance activities and construction wastes.

For the building elements of the Proposed Development, the OneClick LCA 3D Designer tool was utilised. OneClick LCA is certified to EN 15978, ISO 21931 – 1 & ISO 21929, and data requirements of ISO 14040 & EN 15804, and is LEED, BREEAM and PAS 2080 aligned. It allows users to assess the carbon impact of buildings at various stages of design. The tool includes a detailed product and material list based on Irish materials as well as materials from the UK and Europe. The OneClick LCA 3D Designer option allows for a high-level assessment of the embodied carbon impact of a development at early design stages when specific detailed design information is not known and is suitable for EIAR stage assessments.

Inputs into the tool include gross floor areas for the building types (houses/duplexes/apartments), building frame type, number of above ground floors and building size and shape. The tool then makes necessary default assumptions based on these parameters and a typical build-up with the option to refine the default assumptions where project specific information is available. The tool allows for optioneering and optimization of the carbon impact, it highlights the key areas within the building with the highest carbon impact and provides options for lower carbon intensive materials.

Reasonable conservative estimates have been used in this assessment where necessary to provide an estimate of the GHGs associated with the Proposed Development.

The GHG emissions from the development as a total cannot be compared against one specific sector 2030 carbon budget. The emissions are broken down into different assessment categories, and these must be compared separately to the relevant sectoral emissions budgets, which are detailed in Table 9-2. The relevant sectoral emissions for the Proposed Development comparison include the Industry sector, Transport sector, Electricity sector and Waste sector. The predicted emissions for the Proposed Development are annualised over the assumed 60-year lifespan and then compared to the relevant sector 2030 carbon budgets. Annualising the full carbon emissions over the lifetime of the development allows for appropriate comparison with annual GHG targets.

9.2.3.2 Operational Phase

9.2.3.2.1 Operational Phase Energy Use

The EU *Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment* (European Commission, 2013) also states that indirect GHG emissions as a result of a development must be considered, which include emissions associated with energy usage. A Climate Action Statement was prepared by Moloney Fox Consulting Engineers in relation to the Proposed Development and is submitted separately as part of the planning application. The report outlines measures which have been incorporated into the overall design of the development directly in relation to operational phase energy use. These measures will have the benefit of reducing GHG emissions associated with operational energy use during operation and are listed in the mitigation section of this Chapter (Section 9.6).

9.2.3.2.2 Traffic Emissions

Operational phase traffic also has the potential to impact climate. The TII guidance *Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106* (TII, 2025a), 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. The same criteria is applied for climate assessments in lieu of alternative guidance. While the guidance is specific to infrastructure projects, the approach can be applied to any development that causes a change in traffic.

- ▶ Annual average daily traffic (AADT) changes by 1,000 or more;
- ▶ Heavy duty vehicle (HDV) AADT changes by 200 or more;
- ▶ Daily average speed change by 10 kph or more;
- ▶ Peak hour speed change by 20 kph or more;
- ▶ A change in road alignment by 5m or greater.

Punch Consulting Engineers have prepared a Traffic and Transport Impact Assessment for the Proposed Development enclosed separately and have prepared Chapter 13 Material Assets (Traffic and Transportation) of this EIAR. As per Chapter 13, it has been determined by Punch Consulting Engineers that the operational stage traffic will not increase by 1,000 AADT, or 200 HDV AADT, or that the development will not result in speed changes or changes in road alignment. Therefore, the traffic does not meet the above scoping criteria, and a detailed assessment of operational stage traffic GHG emissions is not required as there is no potential for significant impacts to climate. GHG emissions arising from operational traffic are therefore scoped out of this assessment.

9.2.3.3 Significance Criteria

The significance of the impacts of GHG emissions on the climate is an area of scientific consensus that is described clearly in the IPCC AR6 reports (IPCC, 2023), and as such all GHG emissions are considered to contribute adversely towards climate change.

In accordance with ISEP and TII guidance, the significance of the impacts of GHG emission resulting from a given project is based on how it contributes to the overall GHG emissions within the sectoral and national carbon budgets and whether that project contributes or not to the CAP25 objective for Ireland to achieve carbon neutrality by 2050, that is, that a project contributes to reducing GHG emissions. This process requires an assessment of the quantified GHG emissions against the sensitivity of receptors (Ireland's national GHG targets or National Climate Objective), qualification of the potential measures that will mitigate against GHG emissions, and a degree of professional judgement that takes account of the balance of all of these factors. Both the ISEP and TII guidance documents are explicit in this concept.

ISEP guidance (2026) highlights the importance of mitigation in determination of significance committing the project to go further than minimum regulatory compliance. It determines embodied carbon must be addressed and generalised measures found in a CEMP cannot be relied upon to materially reduce significance. Where no sufficient and meaningful mitigation is proposed which supports an applicable 1.5°C or net zero compatible trajectory, beyond minimum compliance with current regulations (such as [sic] Department of Housing, Local Government and Heritage Technical Guidance Document 1), this would typically indicate a significant adverse effect.

In order to streamline the process and provide accountability, the criteria outlined in PE-ENV-01104 (Transport Infrastructure Ireland, 2022) (which are based on the 2022 ISEP guidance and are consistent with the terminology contained within Figure 3.4 of the EPA's (2022) *'Guidelines on the Information to be Contained in Environmental Impact Assessment Reports'*), are used together with the following two factors:

- ▶ The extent to which the trajectory of GHG emissions from the project aligns with Ireland's GHG trajectory to net zero by 2050
- The level of mitigation taking place.

Table 9-3: TII Significance Criteria for Greenhouse Gas Assessment

Effects	Significance Level	Description
Significant adverse	Major adverse	▶ The project's GHG impacts are not mitigated; ▶ The project has not complied with do-minimum standards set through regulation, nor provided reductions required by local or national policies; and ▶ No meaningful absolute contribution to Ireland's trajectory towards net zero.
	Moderate adverse	▶ The project's GHG impacts are partially mitigated; ▶ The project has partially complied with do-minimum standards set through regulation, and has not fully complied with local or national policies; and ▶ Falls short of full contribution to Ireland's trajectory towards net zero.
Not significant	Minor adverse	▶ The project's GHG impacts are mitigated through "good practice" measures. ▶ The project has complied with existing and emerging policy requirements; and ▶ Fully in line to achieve Ireland's trajectory towards net zero.
	Negligible	▶ The project's GHG impacts are mitigated beyond design standards. ▶ The project has gone well beyond existing and emerging policy requirements; and ▶ Well "ahead of the curve" for Ireland's trajectory towards net zero.
Beneficial	Beneficial	▶ The project's net GHG impacts are below zero and it causes a reduction in atmosphere GHG concentration. ▶ The project has gone well beyond existing and emerging policy requirements; and

		► Well “ahead of the curve” for Ireland’s trajectory towards net zero, provides a positive climate impact.
--	--	---

9.2.4 Climate Change Risk Assessment

The Climate Change Risk Assessment (CCRA) involves determining the vulnerability of the Proposed Development to climate change. This requires an analysis of the sensitivity and exposure of the development to climate hazards which together provide a measure of vulnerability.

- **Step 1:** First an initial, high level climate screening of physical hazards is carried out based on location and type of development. This is a qualitative screening intending to only proceed with relevant hazards.
- **Step 2:** The Proposed Development asset categories must be assigned a level of sensitivity to climate hazards. PE-ENV-01104 (TII, 2022) provides the list of asset categories and climate hazards to be considered, as per the below. The asset categories will vary for development type and need to be determined on a development-by-development basis.

- **Asset Categories** Pavements; drainage; structures; utilities; landscaping; signs; light posts; buildings; and fences.
- **Climate Hazards** Flooding (coastal, pluvial, fluvial); extreme heat; extreme cold; wildfire; drought; extreme wind; lightning and hail; landslides; fog.

Following this, all asset categories are assessed on their sensitivity to climate change. The sensitivity is based on a High, Medium or Low rating with a score of 1 to 3 assigned as per the criteria below.

- **High Sensitivity** The climate hazard will or is likely to have a major impact on the asset category. This is a sensitivity score of 3.
 - **Medium Sensitivity** It is possible or likely the climate hazard will have a moderate impact on the asset category. This is a sensitivity score of 2.
 - **Low Sensitivity** It is possible the climate hazard will have a low or negligible impact on the asset category. This is a sensitivity score of 1.
- **Step 3:** Once the sensitivities have been identified the exposure analysis is undertaken. The exposure analysis involves determining the level of exposure of each climate hazard at the project location irrespective of the project type. For example, flooding could be a risk if the project location is next to a river in a floodplain. Exposure is assigned a level of High, Medium or Low as per the below criteria.
 - **High Exposure** It is almost certain or likely this climate hazard will occur at the project location, i.e. might arise once to several times per year. This is an exposure score of 3.
 - **Medium Exposure** It is possible this climate hazard will occur at the project location, i.e. might arise a number of times in a decade. This is an exposure score of 2.
 - **Low Exposure** It is unlikely or rare this climate hazard will occur at the project location, i.e. might arise a number of times in a generation or in a lifetime. This is an exposure score of 1.
 - **Step 4:** Once the sensitivity and exposure are categorised, a vulnerability analysis is conducted by multiplying the sensitivity and exposure to calculate the vulnerability:

$$Vulnerability = Sensitivity \times Exposure$$

9.2.4.1 Significance Criteria for CCRA

The CCRA involves an initial screening assessment to determine the vulnerability of the Proposed Development to various climate hazards. The vulnerability is determined by combining the sensitivity and the exposure of the Proposed Development to various climate hazards.

The vulnerability assessment at this stage excludes mitigation. Table 9-4 details the vulnerability matrix; vulnerabilities are scored on a high, medium and low scale.

The PE-ENV-01104 guidance note that if all vulnerabilities are ranked as low in a justified manner, no detailed climate risk assessment may be needed. Therefore, the impact from climate change on the Proposed Development can be considered to be not significant.

However, following the embedding of mitigation measures, where residual medium or high vulnerabilities exist the assessment may need to be progressed to a detailed climate change risk assessment and further mitigation implemented to reduce risks. According to PE-ENV-01104, an assessment of construction phase CCRA impacts is only required if a detailed CCRA is required. Where a CCRA for the construction phase is not required, best practice mitigation against climate hazards should still be recommended.

Table 9-4: Vulnerability Matrix

		Exposure		
		High (3)	Medium (2)	Low (1)
Sensitivity	High (3)	9 - High	6 - High	3 - Medium
	Medium (2)	6 - High	4 - Medium	2 - Low
	Low (1)	3 - Medium	2 - Low	1 - Low

9.3 Receiving Environment

9.3.1 Current GHG Baseline

Data published in March 2026 (EPA, 2026), indicates that Ireland exceeded, without the use of flexibilities, its 2024 annual limit set under EU's Effort Sharing Decision (ESD) (EU 2018/842) by 3.93 MtCO_{2e}. However, the reported emissions for 2024 represent the second consecutive year in which Ireland's emission were below 1990 levels by 4.2%. Emissions Trading Scheme emissions have decreased by 49.7% or 11.1 MtCO_{2e} compared to 2005 and Effort Sharing Regulation emissions decreased by 10.2% or 5 MtCO_{2e}. Ireland is now a net 2,020 ktCO_{2e} distant from its target under the Effort Sharing Regulation.

The EPA estimate that 2024 total national GHG emissions, excluding LULUCF, have decreased by 1.9% on 2023 levels to 53.93 MtCO_{2e}, with an 8.8% reduction in electricity industries alone. This was driven by an increase in generation from renewables in 2024 by 1.6% and the complete phase-out of peat for electricity generation. Manufacturing combustion and industrial processes decreased by 4.4% to 6.2 MtCO_{2e} in 2024 due to declines in fossil fuel usage. The sector with the highest emissions in 2024 was agriculture at 36.2% of the total, followed by transport at 20.9%. For 2024, total national emissions (including LULUCF) were 58.74 MtCO_{2e} (Table 12.6).

The current estimates of National greenhouse gas emissions (including LULUCF) in 2024 are 12.6% below 2018, well off the target for the National Climate ambition of a 51% reduction by 2030. The data indicate that from 2021 to 2024 Ireland has used 85.2% of the 295 MtCO_{2e} Carbon Budget for the five-year period 2021-2025. This leaves 17.5% of the budget available for 2025, requiring a substantial 14.8% annual emissions reduction across all sectors for 2025 to stay within the budget.

Figures for 2025 emissions are due to be provisionally published by the EPA in July 2026. The final 2025 emissions outturn will determine whether the first carbon budget (2021 to 2025) has been exceeded and, consequently, may necessitate adjustments to the subsequent carbon budget period for 2026 to 2030 in accordance with national carbon budgeting arrangements under the Climate Action and Low Carbon Development (Amendment) Act 2021.

Table 9-5: Trends in Total National GHG Emissions 2021 – 2024

Sector <i>Note 1</i>	Annual Total Emissions for Carbon Budget 1 (Mt CO ₂ e)				Total Budget (Mt CO ₂ e) (2021-2025)	% Budget 2021-2025 Used	Annual % Change 2023-2024
	2021	2022	2023	2024			
Electricity	9.88	9.68	7.56	6.95	40	85.19%	-8.11%
Transport	11.19	11.88	11.93	11.78	54	86.66%	-1.26%
Buildings (Residential)	6.71	5.62	5.23	5.48	29	79.47%	4.84%
Buildings (Commercial and Public)	1.42	1.38	1.34	1.44	7	79.69%	8.05%
Industry	7.25	6.81	6.46	6.18	30	89.00%	-4.37%
Agriculture	21.97	21.78	20.72	20.45	106	80.11%	-1.33%
Other Note 2	1.82	1.85	1.75	1.65	9	78.45%	-5.82%
LULUCF	2.87	2.47	2.96	2.51	-		
Total including LULUCF	63.11	61.48	57.96	56.45	295	81.01%	-2.61%
Total excluding LULUCF	60.24	59.01	54.99	53.93	-	-	-1.93%

Note 1 Reproduced from latest emissions data from the EPA (EPA, 2026).
Note 2 Other includes Petroleum refining, F-Gases and Waste (emissions from solid waste disposal on land, solid waste treatment (composting and anaerobic digestion), wastewater treatment, waste incineration and open burning of waste).

9.3.2 Future GHG Baseline

The future GHG baseline is considered in relation of the ability of the Proposed Development to contribute positively or negatively to the ability of Ireland to meet the binding commitment as part of the Climate Act for carbon neutrality by 2050.

The targets for 2030 and 2050 are described in CAP24 and CAP25 as required by the Climate Act that codified the GHG reductions required by EU Regulation 2018/842 amended by EU Regulation 2023/857 put in place to enable European Member States to meet their obligations under the Paris Agreement. The future baseline is determined by Ireland being able to meet its requirements under these regulations.

Ireland's Greenhouse Gas Emissions Projections 2024-2055 (EPA, 2025) summarises total projected emissions and a breakdown of projected emissions per sector under the 'With Existing Measures' and 'With Additional Measures' scenarios. The EPA projections indicate that currently implemented measures (With Existing Measures) will achieve a reduction of 9.5% on 2005 levels by 2030, significantly short of the 42.0% reduction target. If measures in the higher ambition (With Additional Measures) scenario are

implemented, EPA projections show that Ireland can achieve a reduction of 21.7% by 2030, still short of the 42.0% reduction target.

9.3.3 Current CCRA Baseline

9.3.3.1.1 Climate Hazard Screening

Table 9-6 sets out a qualitative assessment of climate hazards relevant to the Proposed Development. This high-level screening ensures focus is given to relevant climate hazards throughout the remainder of the assessment. The initial climate hazard list is taken from TII PE-ENV-01104.

Table 9-6: Physical Climate Hazard Screening

Climate-related Hazard	Hazard Screening Rationale	Screening
Extreme heat (including extreme heat events and increasing temperatures overtime)	Screen in	High temperatures are a key consideration for both construction and long-term operation of the proposed project. Heat can affect the performance of materials, roofing, road surfaces, electrical systems while also affecting the lifecycle of assets. Extreme heat should therefore be further considered and screened in.
Extreme cold (including frost and snow)	Screen in	Snow and ice events pose significant risks to health, safety, and site operations. Road access may be disrupted, and low temperatures can affect water mains. Freeze-thaw cycles may cause cracking in concrete and road surfaces, with snow clearance and requiring management. Cold temperatures are therefore screened in.
Flooding (pluvial)	Screen in	Surface water is a key vulnerability for any Proposed Development during both construction, operational and decommissioning phases due to the sensitivity of construction materials, site access, and site assets to water exposure therefore it is screened in.
Flooding (fluvial)	Screen in	Fluvial flooding can cause damage to buildings and infrastructure. Foundations can be damaged and in rare cases, homes may become uninhabitable. The FRA by PUNCH Consulting Engineers states the Proposed Development is mainly in Flood Zone C with a small section in Flood Zone A, therefore fluvial flooding is screened in.
Flooding (coastal)	Screen out	Proposed Development approximately 60km from the coast.
Drought	Screen out	Drought is more likely to occur in the future but it is not considered a fundamental issue for the operation of a residential development.
Wildfire	Screen out	The area surrounding the Proposed Development is largely developed and in close proximity to urban centres.
Extreme wind	Screen in	High winds may cause localised disturbance such as road blockages and flying small debris. Damage would be expected to be minor and easily repairable but should be further assessed so is screened in.
Fog	Screen out	Fog is not considered a significant hazard for the Proposed Development, as it does not involve transport, aviation, or activities requiring high visibility.

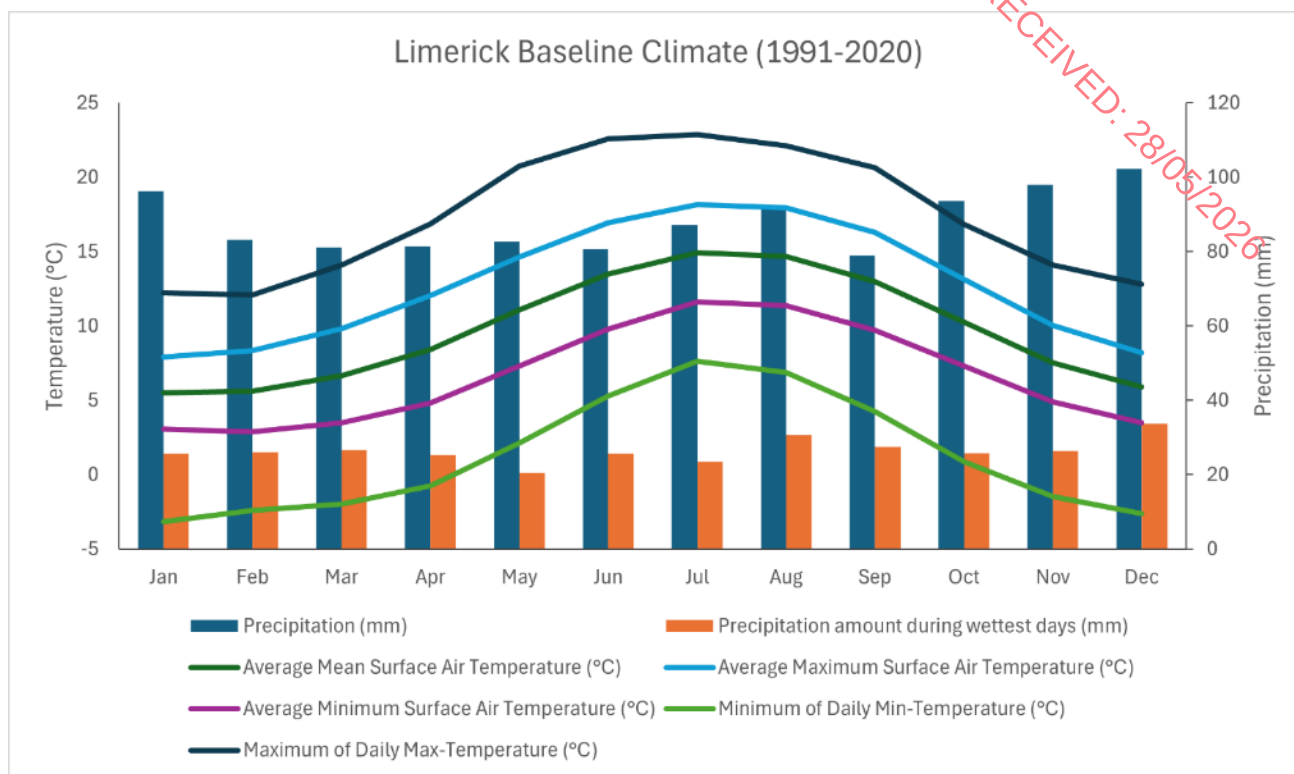
Lightning and hail	Screen out	Proposed Development not at an elevated location and is surrounded by other tall buildings.
Landslides	Screen out	Geological Society of Ireland (GSI) landslide susceptibility mapping database categorized location as low for landslide susceptibility.

9.3.3.2 *Extreme temperatures and precipitation*

The region of the Proposed Development has a temperate, oceanic climate, resulting in mild winters and cool summers. This baseline data is derived from the European Centre for Medium-Range Weather Forecasts (ECMWF) ERA5 data reanalysis and presented on the World Bank Group Climate Change Knowledge Portal (World Bank Group, 2026b) which includes observed data from local meteorological weather stations across Ireland from 1950-2023. This data is re-analysed to model a complete picture of Irelands historical climate. This method has been chosen to ensure data can be analysed at the daily level and harmoniously compared with future scenarios. The baseline time-period referred to in this assessment was from 1991-2020 and is specific to the county of Limerick.

Climate averages for the 30-year period from 1991-2020 are shown in Figure 9.2. The data show that there are two distinct peaks in precipitation, one occurring in the period July to September peaking in August at 91.6 mm, and another wetter period from October to January with December being the wettest month on average with rainfall of 102.2 mm. The period from February to July experiences rainfall below the average for the year (88.1 mm). December is when the wettest days occur with daily average maximum rainfall of 33.7 mm. The driest month is September with 79.0 mm of rainfall which is below the annual average.

Figure 9.2: Climate Averages for Limerick, Ireland, for the period 1991-2020



July is the warmest month on average with a mean surface air temperature of 14.9°C. July also experiences the average maximum surface air temperature (18.2°C) and the daily maximum temperature (22.8°C). January is the coldest month on average with a mean average surface temperature of 5.5°C and recording the daily minimum temperature (-3.2°C), however the average minimum surface air temperature of 2.8°C occurs in February.

Wind and storms

At Shannon Airport during the period 1991-2020, the average wind speed was 9.1 knots (16.9 kmh), the average windiest month being February at 10.1 knots (18.7 kmh). Historically, the highest absolute gust of 86.0 knots (159.3 kmh) was recorded in February 2014 during Storm Darwin. With reference to recent extreme weather events in Ireland, storm Éowyn hit the island in January 2025 and recorded a 10-minute mean wind speed of 142 kmh in Galway, with the highest gust being 184 kmh. Four weather stations broke their highest gust records during this storm and two stations reached hurricane force 12 on the Beaufort scale.

Later in the year storm Amy also resulted in strong winds such that five recording stations broke their records for 10-minute mean wind speeds. Overall, there were five named storms to hit Ireland in 2025.

Wildfire

The Limerick area is classified at being of a medium risk of wildfire by the World Bank Global Facility for Disaster Reduction and Recovery (GFDRR) Think Hazard (World Bank Group, 2026a) dataset. The Limerick City Council Climate Action Plan 2024-2029 makes no mention of wildfires regarding it as a low risk.

Flood

A Site-Specific Flood Risk Assessment undertaken by PUNCH Consulting Engineers showed the site is at low risk from pluvial, groundwater or coastal flooding. The majority of the site falls within fluvial flood zone C meaning the risk of flooding is very low. However, the surface water discharge pipe downstream of the attenuation pond is located within Flood Zone A as it is discharging to the river.

Landslides

The site location has no record of previous historical landslides and is not susceptible to the risk of future landslides (GSI, 2026).

9.3.4 Future CCRA Baseline

9.3.4.1 Climate Change Impacts and Projections for Ireland

Ireland is already experiencing increased annual rainfall in the north and west, with more variable patterns in the south and east (EPA, 2021b). Key risks identified by the EPA relevant to Ireland:

- ▶ Increased likelihood of more frequent and intense North Atlantic low-pressure systems bringing high rainfall and high winds.
- ▶ More intense rainfall periods which may lead to pluvial flooding and elevated fluvial levels.
- ▶ Longer dry spells and increased temperatures will elevate the risk of wildfire.

9.3.4.2 Climate Modelling and Planning

International best practice and national policy such as the NCCRA (2024), IPCC (2023), and Transport Infrastructure Ireland (TII, 2022) recommends using two emission scenarios to project future climate change. This includes a moderate and high emission scenarios (RCP4.5 and RCP8.5) for future planning. These Representative Concentration Pathways (RCPs) reflect varying levels of global climate mitigation explained below.

- ▶ RCP 4.5 (a 'moderate' scenario) represents an approximate 2.4°C increase in global average temperatures (1.7-3.2°C). It assumes moderate mitigation efforts leading to stabilisation of emissions by mid-century and is generally aligned with current policies for emission reduction.
- ▶ RCP 8.5 (a 'worst case' / high emissions scenario) represents an approximate 4.3°C increase in global average temperatures (3.2-5.4°C) and assumes continued high emissions with minimal mitigation. This high-end scenario is useful for understanding potential impacts of current emission trends continue. Consequently, this scenario will result in the highest level of physical risk for Ireland, and therefore the greatest requirement for adaptation.

This climate change assessment uses the latest climate change projections standardised and bias corrected for Ireland available through the EPA and the TRANSLATE project (EPA, 2025e).

9.3.4.3 Key Findings from Climate Projections

Table 9-7 provides a detailed comparison of baseline and future climatology across a medium (RCP4.5) and high emissions scenario (RCP8.5) up to 2100.

Key Projected changes include:

- ▶ Average maximum temperatures rising by 2.7°C (late century, RCP8.5) and overall mean temperatures increasing 1.1°C and 1.5°C by mid-century under RCP4.5 and RCP8.5 respectively.
- ▶ Annual precipitation rising by 29mm (mid-century, RCP4.5) with maximum 1-day rainfall increasing by 9mm (2071-2100, RCP8.5).
- ▶ Fewer frost days (-23 days >0°C, 2071-2100, RCP8.5).
- ▶ Increased number of heatwaves (5 consecutive days >25°C).

Longer dry periods and heavy rainfall events are predicted. Met Éireann has high confidence in maximum rainfall rates increasing but not in how the frequency or intensity of storms will change with climate change.

Impacts resulting from climate change hazards will evolve and have the potential to include increases in global temperatures and increases in the intensity and frequency of rainfall days per year combined with increases in the intensity and frequency of low-pressure systems in the north Atlantic during the winter storm period. Therefore, it is expected that the climate over the proposed site in will evolve over time and consideration is needed with respect to this within the design of the Proposed Development.

Overall 10m mean windspeed is projected to decrease marginally ($\sim <1\%$) across all seasons of the year with a high degree of certainty (EPA, 2025c).

Table 9-7: Predicted future climate hazards across RCP4.5 and RCP8.5 up to 2100

Climate Hazard	Indicator	Baseline	RCP4.5		RCP8.5	
		(1976-2005)	(2041-2070)	(2071-2100)	(2041-2070)	(2071-2100)
Temperature	Mean temp (°C)	10.27	11.4 (+1.1)	11.8 (+1.5)	11.8 (+1.5)	13.0 (+2.7)
	Mean Max temp (°C)	14.01	15.0 (+1.0)	15.4 (+1.4)	15.5 (+1.4)	16.6 (+2.6)
	Mean Min temp (°C)	6.53	7.7 (+1.1)	8.1 (+1.6)	8.1 (+1.6)	9.4 (+2.9)
	Average of Daily Max temp (°C)	25.99	28.6 (+2.6)	29.6 (+3.6)	29.2 (+3.2)	30.1 (+4.1)
	Frost Days (Nr.)	29.07	16.8 (-12.2)	13.1 (-16.0)	13.1 (-15.9)	5.9 (-23.1)
Precipitation and Flooding	Annual precipitation (mm)	980	1009 (+29)	1032 (+52)	1027 (+47)	1068 (+88)

	Max 1-day (mm)	28	33 (+5)	35 (+6)	33 (+5)	37 (+9)
Storms and high winds	Storm Frequency and Average speed	On Average 8 named storms annually with speeds exceeding 100km/hrN.1	Winter storm frequency is projected to increase, with a possible extension of the storm season. While the intensity of individual storms cannot be accurately projected, storm wind speeds are likely to remain above 100 km/hr.			
	Max Gust speed	86.0 knots (159.3 kmh) N.2				
Note-1: Data from combined Met Éireann						
Note-2: Data from Shannon Airport (~22km from site), 1991-2020						

9.4 Characteristics of the Proposed Development

9.4.1 Proposed Development Overview

The Proposed Development comprises five residential apartment blocks with a total of 403 no. residential units, ranging from five to eight storeys in height; a medical centre located at the western edge of the site; a creche located at ground level within Block B; and all associated site works and development. The current proposals also extend to the R445 to accommodate a proposed entrance from the R445. They will also include a proposed nature-based surface water drainage solution within the neighbouring Groody Valley green wedge.

9.4.2 Construction Stage

During the construction phase embodied carbon of materials used in the construction of the development along with site activities will impact climate. Engine emissions from site vehicles and machinery have the potential to impact climate through the release of CO₂ and to a lesser extent, other greenhouse gases. Impacts to climate are assessed against Ireland's obligations under the EU 2030 GHG targets and sectoral emissions ceilings.

9.4.3 Operational Stage

Engine emissions from vehicles accessing the site have the potential to impact climate during the operational phase of the development through the release of CO₂. Emissions from the operational phase of the residential buildings are qualified through the Climate Action Statement produced by Moloney Fox Consulting Engineers. In addition, the vulnerability of the Proposed Development in relation to future climate change must be considered during the operational phase.

9.5 Potential Impact of the Proposed Development

9.5.1 Greenhouse Gas Assessment

9.5.1.1 Construction Stage

The results of the GHGA are shown in Table 9-8. This includes both the outputs from the OneClick LCA tool and the TII Carbon Tool. Construction materials (Construction materials for buildings and Construction materials external to buildings) make up the majority of GHG emissions for the Proposed Development, accounting for approximately 87% of the total construction phase GHG emissions. Other contributions are

from Construction Energy (6%) and Material Transport (5%). It should be noted that Construction Energy is likely over estimated due to the application of default factors in OneClick which do not take the energy source into consideration. As set out in Section 9.6, Hydrogenated Vegetable Oil (HVO) will be used on this project during the construction phase to power plant and vehicles.

Avoided carbon is associated with the re-use of excavated materials on site. Excavated materials are inert and therefore do not attract an emissions factor however re-using them on site reduces GHG emissions associated with transport of the materials.

It has been calculated that the total construction phase embodied carbon for the Proposed Development will be 31,503 tCO_{2e}.

Table 9-8: GHG Construction Phase Assessment Results

PAS2080 LC Stage	TII Category	tCO _{2e}	Predicted GHG Emissions as % of Construction Phase	Sector
A0	Clearance and demolition	3	<1%	Industry
A1-A5	Construction materials for buildings	14,838	47%	Industry
A1-A3	Construction materials external to buildings	12,584	40%	Industry
A4	Material Transport	1,577	5%	Transport
A4	Construction Worker Travel to Site	540	2%	Transport
A5	Excavation	43	<1%	Industry
A5	Construction energy	1,912	6%	Electricity
A5	Construction Waste Disposal	6	<1%	Waste
A5	Construction Waste Transport	<1	<1%	Transport
Total		31,503 tCO_{2e}		
Avoided emissions		22 tCO _{2e}		

9.5.1.2 Operational Stage

The results of the GHGA are shown in Table 9-9. This includes both the outputs from the OneClick LCA tool and the TII Carbon Tool. GHG Emissions from maintenance includes embodied carbon of new materials required to repair or replace building elements through the lifetime of the Proposed Development. It is quantified using default product specifications in OneClick. Operational waste disposal data has been taken from the Waste Chapter (Chapter 13) and the transport of the waste is calculated using default in the TII tool, both values have been multiplied by the lifespan of the building.

It has been calculated that the total operational phase GHG emissions for the Proposed Development will be 7,104 tCO_{2e}.

Table 9-9: GHGA Operational Phase Assessment Results across the lifespan of the Proposed Development

PAS2080 LC Stage	TII Category	tCO ₂ e	Predicted GHG Emissions as % of Operational Phase	Sector
B1-B5	Operational Waste Disposal	683	10%	Waste
B1-B5	Operational Waste Transport	259	4%	Transport
B1-B5	Maintenance	6,161	87%	Industry
Total		7,104 tCO ₂ e		

As set out in Section 9.2.3, operational traffic has been scoped out of this assessment.

The Proposed Development has been designed to reduce the impact to climate where possible. A number of measures have been incorporated into the design to ensure the operational phase emissions are minimised. The primary elements with respect to reducing climate impacts and optimising energy usage are summarised in Section 9.6.2 and are based on information provided within the Climate Action Statement was prepared by Moloney Fox Consulting Engineers.

9.5.1.3 Contextualisation of GHGA

In Table 9-10, GHG emissions have been compared against the carbon budget for the industry, transport, electricity and waste sectors in 2030, against Ireland's total GHG emissions in 2024, and against Ireland's EU 2030 target of a 42% reduction in non-ETS sector emissions based on 2005 levels (27.7 Mt CO₂e) (set out in Regulation EU 2018/842).

The estimated total GHG emissions annualised over the 60-year Proposed Development lifespan are shown in Table 9-10 and are a small fraction of the sectoral budgets.

Table 9-10: Estimated GHG Emissions Relative to Sectoral Budgets and GHG Baseline

Target/Sectoral Budget (tCO ₂ e)		Annualised Development GHG Emissions (tCO ₂ e)		% of Relevant Target/Budget
Ireland's 2024 Total GHG Emissions (existing baseline)	5,764,000	38,607	Total GHG Emissions	0.07%
Non-ETS 2030 Target	27,722,000			0.14%
2030 Sectoral Budget (Industry Sector)	4,000,000	560	Total Industry Emissions	0.01%
2030 Sectoral Budget (Transport Sector)	6,000,000	40	Total Transport Emissions	0.001%
2030 Sectoral Budget (Waste Sector)	1,000,000	11	Total Waste Emissions	0.001%
2030 Sectoral Budget (Electricity Sector)	3,000,000	32	Total Electricity Emissions	0.001%

9.5.1.4 GHGA Significance of Effects

As set out in Table 9-10, the Proposed Development will negatively contribute to Ireland's trajectory to achieving net zero by 2050 as GHG emissions contribute a small fraction towards the national and sectoral budgets.

In accordance with the EPA Guidelines (EPA, 2022), the above criteria equates to an impact of GHG emissions during the construction phase of a **direct** impact due to its presence, that is **long-term** due to the nature of GHG emissions and their atmospheric lifetime and **negative** due to the emission of GHGs. As the Proposed Development marginally impedes the trajectory to carbon neutrality, the impact on the climate is **moderate**, which overall, is considered to be **significant** in EIA terms.

In accordance with the EPA Guidelines (EPA, 2022), the above criteria equates to an impact of GHG emissions during the operational phase of a **direct** impact due to its presence, that is **long-term** as a result of the estimated lifetime of the buildings and atmospheric lifetime of GHG emissions and **negative** due to the emission of GHGs. As the Proposed Development impedes the trajectory to carbon neutrality, the impact on the climate is **moderate**, which overall is considered to be **significant**.

9.5.2 Climate Change Risk Assessment

9.5.2.1 Construction Stage

Whilst the development is likely to be exposed to potential weather extremes due to climate change during the construction phase, the potential length of the construction phase and its transient nature means that a detailed CCRA of this phase is scoped out.

The following non-exhaustive list of risks has been identified:

- ▶ Flood Risk due to increased precipitation, and intense periods of rainfall. This includes fluvial and pluvial flooding affecting unfinished structures or access roads/pavement
- ▶ Increased temperatures potentially causing drought, wildfires and prolonged periods of hot weather potentially affecting setting concrete or cement, dust suppression and construction worker health and safety
- ▶ Reduced temperatures resulting in ice or snow potentially affecting setting concrete or cement, landscaping and construction worker health and safety
- ▶ Major storm damage including wind damage potentially affecting landscaping, stored materials, vertical infrastructure and construction worker health and safety

9.5.2.2 Operational Stage

9.5.2.2.1 Sensitivity Analysis

The aim of the sensitivity analysis is to identify which climate hazards are relevant to the specific type of project, irrespective of its location. Individual components within the Proposed Development are assessed against each climate hazard.

Table 9-11: Receptors and their sensitivity to climate hazards

Sensitive Receptors	Sensitivity to Climate Hazards (No consideration of site location)				
	Extreme Heat	Extreme Cold	Flood (Pluvial)	Flood (Fluvial)	Extreme Wind
Building & structures	1	1	2	2	1

Drainage	1	1	2	2	1
Health and wellbeing	2	1	2	2	2
Roads	2	1	2	2	1
Communal gardens	2	2	1	1	2
Critical systems	2	1	2	2	2
1= Low, 2= Medium, 3= High					

Table 9-11 shows low sensitivity and medium sensitivity for relevant climate hazards when assessed against sensitivity receptors. High sensitivity was not proposed for any of the sensitivity receptors. The majority of the medium risks are to the health and wellbeing of the residents and to critical systems. By the EU Technical guidance definition, a high risk is "the climate hazard will or is likely to have a major impact on the asset category". Due to the nature of the Proposed Development and strict building regulations ensuring buildings in Ireland are constructed to a high quality and with some resilience to climate hazards, the risks to the receptors are not considered high.

9.5.2.2.2 Exposure Analysis

The exposure of the Proposed Development to climate risks is highly dependent on the project location. The aim of the exposure analysis is to identify which climate hazards are relevant to the planned project location. This assessment is based on current climate described in Section 9.3.3.

Table 9-12: Exposure of Proposed Development to the climate hazards

Climate Exposure	Exposure Risk to Climate Hazards (Consider the site location)				
	Extreme Heat	Extreme Cold	Flood (Pluvial)	Flood (Fluvial)	Extreme Wind
Exposure at project location	2	1	1	1	2
1= Low, 2= Medium, 3= High					

Table 9-12 shows the locality of the Proposed Development is at low or medium exposure to the climate hazards. Medium exposure is defined as "this climate hazard occurs at the project location a number of times in a decade". The assessment has been based on information in Section 9.3.3 for example extreme wind is evidenced by the number of named storms discussed in Table 9-7. Occurrences of extreme heat also sit within the medium exposure category based on the current climate. Exposure of the Proposed Development to pluvial and fluvial flooding was determined by the FRA prepared by PUNCH Consulting Engineers. The FRA determines that the redevelopment of the site will not adversely affect pluvial flood levels or extents in the area when a suitable surface water drainage system is installed. Fluvial flooding

from the River Groody or River Shannon will not impact the site due to the height of the existing site rising away from the river.

9.5.2.2.3 Vulnerability Analysis

This assessment combines the outcomes of the sensitivity and exposure analysis to determine which climate hazards pose a risk to the Proposed Development. The vulnerability of the Proposed Development to climate risks is determined based on the sensitivity and the exposure as follows:

$$Vulnerability = Sensitivity \times Exposure$$

The vulnerability of the Proposed Development to the risks of Climate Change impacts is shown in Table 9-13 below:

Table 9-13: Vulnerability of the Proposed Development to the risks of climate change impacts

Receptors	Vulnerability Analysis				
	Extreme Heat	Extreme Cold	Flood (Pluvial)	Flood (Fluvial)	Extreme Wind
Buildings & Structures	2	1	2	2	2
Drainage	2	1	2	2	2
Health, safety & wellbeing	4	1	2	2	4
Roads	4	1	2	2	2
Communal gardens	4	2	1	1	4

Critical systems	4	1	2	2	4
1, 2 = Low; 3, 4 = Medium; 6,9 = High					

Table 9-13 shows a collective rating of each receptor's vulnerability to the hazards that were screened in. Health and wellbeing of the users of the Proposed Development, the communal gardens and critical systems are the most vulnerable to the physical hazards. Extreme heat poses a threat to the receptors as it can cause overheating of critical systems, heat stress on residents, damage plants and landscaping and cause road surfaces to buckle.

Extreme winds have the potential to cause damage to the receptors through flying debris, uprooting of trees and plants and damage exposed electrical systems which can in turn have a cascading effect on the health and wellbeing of the users of the Proposed Development e.g. if the power supply is damaged, residents may experience power outages.

9.5.2.3 CCRA Significance of Effects

In the absence of design mitigation, there is a medium risk to the Proposed Development as a result of climate change. In accordance with the EPA Guidelines (EPA, 2022), the significance of effect of the impacts to the Proposed Development as a result of climate change are **direct** as climate extremes have a direct physical effect on buildings and infrastructure, **long-term** due to the response times of the climate in relation to changes in anthropogenic emissions, **negative** as climate extremes have been shown to damage or adversely affect infrastructure, and **moderate** due to the medium vulnerability of the Proposed Development to the effects of climate change, which is overall **significant** in EIA terms.

9.5.3 Do-Nothing Impact

In the Do-Nothing scenario, 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).

As the site is zoned for development, in the absence of the Proposed Development it is likely that a development of a similar nature would be constructed in the future in line with national policy and the development plan objectives. Therefore, the construction and operational phase impacts outlined in this assessment are likely to occur in the future even in the absence of the implementation of the Proposed Development.

9.6 GHG Mitigation Measures

9.6.1 Construction Stage

Embodied carbon of materials and construction activities will be the primary source of climate impacts during the construction phase.

The Design Team intend to mitigate GHG emissions during the construction phase by re-using materials which are already in situ on the brownfield site. A shopping centre was partially constructed in 2007 and was demolished in 2020, with reinforced concrete retaining walls left in situ. It is understood that much of the material from the demolition was used for backfilling and land raising purposes on the site such that the site is now predominately covered in made ground. This reduces the volume of new material which will be required for backfilling at the site. Further, the retaining walls will be incorporated as part of

the Proposed Development negating the requirement for additional reinforced concrete to be procured for this element of the works.

The floor levels of some blocks have been designed to a height which reduces excavation requirements on site. In addition, 10% of excavated material will be used on site for landscaping and backfill which will avoid 22tCO₂e from its transport to processing sites. More information on this mitigation measure can be found in the Waste Chapter (Chapter 14).

HVO fuelled vehicles and plant will be used during construction which will reduce GHG emissions compared to petrol or diesel. The HVO will be sourced from sustainable sources and a Chain of Custody Certificate to evidence the source will be obtained from the supplier.

As set out in the Waste Chapter (Chapter 14):

- ▶ Building materials will be chosen to 'design out waste', in line with circular economy principles and green procurement strategies outlined in the RWMP. Product selection will, where practicable, favour materials with recycled content and take-back schemes.
- ▶ On-site segregation of waste materials will be carried out where possible to increase opportunities for off-site reuse, recycling and recovery.
- ▶ 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 leaving site will be reused, recycled or recovered, where possible, to avoid material designated for disposal;

In addition to the above, during the construction phase the following best practice measures shall be implemented on site to prevent significant GHG emissions and reduce impacts to climate:

- ▶ Prevention of on-site or delivery vehicles from leaving engines idling, even over short periods.
- ▶ Ensure all plant, machinery and vehicles are well maintained and inspected regularly.
- ▶ Using grid connections for electric power when practicable instead of HVO fuel powered generators
- ▶ Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site.
- ▶ Sourcing materials locally will be prioritised. This will help to reduce transport related CO₂ emissions and helps support local suppliers, further promoting economic sustainability.
- ▶ Material choices and quantities will be reviewed during detailed design, to identify and implement any lower embodied carbon options, where feasible. For example, a 30% minimum clinker replacement in cement may be utilised in line with the requirements for public bodies.

9.6.2 Operational Stage

With reference to the Climate Action Statement (Moloney Fox Consulting Engineers, 2025), sustainable building practices and technologies have been incorporated into the Proposed Development design to reduce the impact on climate wherever possible.

The Climate Action Statement states that the development will be a Nearly Zero Energy Building (NZEB) in accordance with the 2022 Part L requirements. NZEB buildings are required to generate 20% of their energy requirements from renewable sources. The Proposed Development buildings will be constructed to achieve an A2 BER rating, in line with NZEB standards. Electrically driven exhaust air heat pumps have been incorporated into the Proposed Development design to meet the heating requirements for the residential dwellings and achieve the requirement to generate 20% of energy from renewable sources. Exhaust air heat pumps are designed to provide ventilation, heating, and hot water to units with very low energy demand.

Additional sustainable technologies incorporated into the development design include solar PV installations across the roofs of the apartment blocks, the use of Demand-Control-Ventilation (DCV), which optimizes the amount of fresh air to improve indoor air quality while increasing energy efficiency. LED lighting and smart lighting controls will be implemented to increase energy efficiency and promote energy conservation.

A number of sustainable design features have been considered within the design to achieve the sustainability targets of the Proposed Development. These include:

- ▶ The proximity of the development to public transportation networks
- ▶ The proximity of the Proposed Development to active travel networks and car sharing locations including the BusConnects route planned for 2027
- ▶ Electric vehicle (EV) parking spaces provided for residential (21 no. spaces / 20%) and commercial use (6 no.).
- ▶ Installation of infrastructure for additional EV charging to allow for future installation of EV charging points
- ▶ The Residents/ Staff / Facilities Management will ensure on-Site segregation of all waste materials into appropriate categories

The above measures will assist in optimising the energy consumed by the Proposed Development which will reduce the impact to climate during the operational phase of the Proposed Development.

9.7 CCRA Mitigation Measures

9.7.1 Construction Stage

In terms of impact on the Proposed Development due to climate change, during construction the Contractor will be required to mitigate against the effects of extreme rainfall/flooding, extreme temperatures and wind and storms through site risk assessments, method statements and good site management practice. All materials used during construction will be accompanied by certified datasheets which will set out the limiting operating temperatures. Temperatures can affect the performance of some materials, and this will require consideration during construction.

9.7.2 Operational Stage

9.7.2.1 Extreme heat and cold

Extreme temperatures, both hot and cold, can affect building materials and infrastructure; however, the project will use materials that comply with current standards and are designed to withstand projected climate extremes. Cold events are expected to decline, reducing the risk of cracking from freeze thawing of road surfaces and deterioration of auxiliary systems and infrastructure. However, cold events are still anticipated and systems have been designed with this in mind, for example, solar panel systems are designed to accommodate snow load. While potential heat-related impacts such as road surface softening are possible during heatwaves, projected extremes are not expected to reach critical thresholds for infrastructure failures seen in other European countries.

Further, tree planting and green infrastructure will provide shading and sequester carbon dioxide, reducing global warming. Native and drought tolerant planting are included in the landscaping design proposed and will include plants such as lavender, sedum, salvia, yarrow, and native plants that thrive with limited water.

9.7.2.2 Fluvial Flooding

The Proposed Development is at low risk from fluvial flooding from the Groody River and the River Shannon. The outfall pipe from the development is in Flood Zone A but the rest of the development is in Flood Zone C. Flood mitigation set out in the FRA by Punch Consulting Engineers include:

- ▶ The proposed lowest Finished Floor Level for the Proposed Development is 10.20mAOD. This level is in accordance with best practice and 4.17m above the CFRAMS 1% AEP (Catchment Flood Risk Assessment and Management) MRFS (Mid-range Future Scenario) fluvial water level. This indicates that under a mid-range future climate change scenario, the Proposed Development could withstand and be protected against a 1 in 100 year flood event.
- ▶ As part of the site maintenance plan, all future proprietors inspect all road gullies in the vicinity and report any blockages to the Local Authority, development management company and/or Irish Water. The proprietor should also inspect all surface water drainage within the site, in particular following heavy rain which may cause debris to obstruct the ACO drain and road gullies;

9.7.2.3 Pluvial Flooding

Pluvial Flooding is the result of rainfall-generated overland flows which arise before run-off can enter any watercourse or sewer. It is usually associated with high-intensity rainfall. The provision of a suitable surface water drainage system for any Proposed Development on the site will mitigate against this risk. The proposed stormwater drainage arrangements have been designed using Causeway Flow software in accordance with the Department of Environment and Local Government's guidance document - "*Recommendations for Site Development Works for Housing Areas*", with guidance taken from the "*Greater Dublin Strategic Drainage Study*" (GSDSDS), CIRIA Publications C644 - "*Building Greener*" and the Limerick Development Plan 2022-2028.

The proposed drainage has also been designed to meet the requirements of the Greater Dublin Strategic Drainage Study and Limerick Development Plan 2022-2028 to limit site discharge 2 l / s / ha or Qbar, and to provide interception storage in line with Limerick Council drainage requirements.

The following Sustainable Urban Drainage System (SuDS) features have been incorporated into the Proposed Development design:

- ▶ Hydrobrake;
- ▶ Green Roofs;
- ▶ Permeable Pavements;
- ▶ Rain Gardens;
- ▶ Infiltration Trenches;
- ▶ Engineered Swales;
- ▶ Tree Root Systems; and
- ▶ Attenuation Ponds

9.7.3 Extreme Wind

To mitigate against the effects of extreme winds utilities are expected to be buried and not exposed. In terms of the buildings and structures, foundations are designed to transfer load from high winds experienced by buildings directly to ground in accordance with the relevant Eurocodes. The landscaped areas pose a risk from flying debris. To reduce this risk, the Landscape architect has confirmed maintenance, and management plans will include:

- **Pruning for Airflow:** Regularly prune trees and large shrubs to thin dense crowns
- **Deadwood Removal:** Remove dead, diseased, or weak branches, which are the first to fall during high winds.

- **Staking and Support:** Stake young, top-heavy, or newly planted trees securely to help them establish roots without falling.
- **Root Protection:** Ensure trees have healthy soil to encourage deep, anchoring roots.

Solar PV panels sit on metal frames which are held in place by concrete blocks or ballast trays. The weighting of the panels will be calculated to resist wind uplift and are generally tilted at 5-15° to reduce wind load.

9.8 Monitoring

Monitoring and reporting of the embodied carbon in the construction phase will be conducted. The aim of monitoring will be to seek further ways to minimise climate impacts. Monitoring will include contractual obligations, in line with the most recent Climate Action Plan and sectoral targets, for the successful tenderer to ensure that the Proposed Development stays in line with updated aims. Commitments to monitor GHG emissions during the construction phase will also be secured through the final Construction Environmental Management Plan (CEMP). Monitoring will include embodied carbon of construction materials, water usage, power and fuel usage, and waste generation (including reuse and recycling rates). Where monitoring shows that the Proposed Development is not meeting its targets, further mitigation will be put in place.

Monitoring should also include reviewing potential for extreme weather events which may cause damage during construction. Contractors' Environmental Management System (EMS) will include measures to address risks during such events i.e. flooding.

9.9 Residual Effects of the Proposed Development

9.9.1 GHG Residual Effects

The TII guidance states that the following two factors should be considered when determining significance:

- ▶ The extent to which the trajectory of GHG emissions from the project aligns with Ireland's GHG trajectory to net zero by 2050; and
- ▶ The level of mitigation taking place.

TII reference the ISEP guidance (2022) which states that the crux of assessing significance is:

"not whether a project emits GHG emissions, nor even the magnitude of GHG emissions alone, but whether it contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050".

As set out in Table 9-10, the Proposed Development will marginally impede Ireland's trajectory to achieving net zero by 2050 as GHG emissions contribute a small fraction towards the national and sectoral budgets. Further, although the Proposed Development will result in GHG emissions during the construction and operational phases; the Proposed Development will minimise its impacts through design and management measures (see Section 9.6.1). The level of mitigation described in Section 9.6 has therefore been taken into account when determining the residual significance of the proposed project's GHG emissions.

Based on the above reasoning, according to the TII significance criteria, the residual significance of the GHG emissions during the construction and operational phase is **minor adverse**. The ISEP GHG guidance (ISEP, 2022) (which has been embraced by the updated TII Guidance (TII, 2022) in Section 6.7.2) describes minor adverse as follows:

"A minor adverse not significant impact is described with: A project that is compatible with the budgeted, science based 1.5°C trajectory (in terms of rate of emissions reduction) and which complies with up-to-date policy and 'good practice' reduction measures to achieve that has a minor adverse effect that is not significant. The project may have residual impacts but is doing enough to align with and contribute to the relevant transition scenario. A 'minor adverse' or 'negligible' non-significant effect conclusion does not necessarily refer to the magnitude of GHG emissions being carbon neutral (i.e. zero on balance) but refers to the likelihood of avoiding severe climate change and achieving net zero by 2050. A 'minor adverse' effect or better is a high bar and indicates exemplary performance where a project meets or exceeds measures to achieve net zero earlier than 2050."

In addition, the TII guidance (2022) describes minor adverse as:

- ▶ The project's GHG impacts are mitigated through 'good practice' measures.
- ▶ The project has complied with existing and emerging policy requirements; and
- ▶ Fully in line to achieve Ireland's trajectory towards net zero.

In accordance with the EPA Guidelines (EPA, 2022), the above criteria equates to an impact of GHG emissions during the construction phase of a **direct** impact due to its presence, that is **long-term** as a result of the atmospheric lifetime of GHG emissions, **negative** due to the emission of GHGs and **slight** based on the reduced contribution of GHG emissions to Ireland's national trajectory to net zero, due to the outlined mitigation measures. Overall, the impact on the climate is considered to be **not significant** in EIA terms.

In accordance with the EPA Guidelines (EPA, 2022), the above criteria equates to an impact of GHG emissions during the operational phase of a **direct** impact due to its presence, that is **long-term** as a result of the estimated lifetime of the buildings and atmospheric lifetime of GHG emissions and **negative** due to the emission of GHGs and **slight** based on the reduced contribution of GHG emissions to Ireland's national trajectory to net zero, due to the outlined mitigation measures. Overall, the impact on the climate is considered to be **not significant** in EIA terms.

9.9.2 CCRA Residual Effects

With design mitigation in place, there are no residual risks to the Proposed Development as a result of climate change. In accordance with the EPA Guidelines (EPA, 2022), the significance of effect of the impacts to the Proposed Development as a result of climate change are **direct** as climate extremes have a direct physical effect on buildings and infrastructure, **long-term** due to the response times of the climate in relation to changes in anthropogenic emissions, **negative** as climate extremes have been shown to damage or adversely affect infrastructure, and **not significant** due to the low vulnerability of the Proposed Development to the effects of climate change once mitigation measures have been embedded, which is overall **not significant** in EIA terms.

9.10 Cumulative Impacts of the Proposed Development

In accordance with guidance from the ISEP (2022) and TII (2022) the climate is not constrained by project, regional or national boundaries and therefore the GHG assessment has been presented in the context of the national and sectoral carbon budgets for the whole of Ireland and the ability of the Proposed Development to assist or impede the national relevant targets. Given the contribution of such targets to the global efforts to reduce the impact of society upon the climate the assessment is considered to be inherently cumulative.

In light of this, the residual cumulative impact of the Proposed Development in relation to GHG emissions is considered **direct, long-term, negative** and **slight**, which is overall **not significant** in EIA terms.

9.11 Section 15 Compliance

Section 15 of the 2015 Act, sets out the duties imposed by certain bodies, including local authorities and An Coimisiún Pleanála. This section was amended by the 2021 Act and states:

“(1) A relevant body shall, in so far as practicable, perform its functions in a manner consistent with—
(a) the most recent approved climate action plan,
(b) the most recent approved national long term climate action strategy,
(c) the most recent approved national adaptation framework and approved sectoral adaptation plans,
(d) the furtherance of the national climate objective, and
(e) the objective of mitigating greenhouse gas emissions and adapting to the effects of climate change in the State.”.

This chapter demonstrates how the Proposed Scheme is consistent with the objectives of Section 15 of the 2015 Act (as amended). The EIAR has carried out a greenhouse gas emissions assessment and assessed the Proposed Scheme’s resilience/adaptation to climate change.

- ▶ Greenhouse Gas Emissions Assessment – This assessment considers the Proposed Scheme’s GHG emissions over its lifetime. The assessment analyses these emissions in the context of the relevant carbon budgets, targets and policies to ensure consistency with the most recent approved climate action plan and the most recent approved national long term climate action strategy, and with measures in furtherance of the national climate objective. This complies with subsections 15 (1) (a), (b), and (d) of the Act.
- ▶ Climate Change Vulnerability Assessment – This assessment identifies the impact of a changing climate on the Proposed Scheme and receiving environment in the context of the most recent approved national adaptation framework and approved sectoral adaptation plans. The assessment considers the Proposed Scheme’s vulnerability and adaption to climate change and identifies adaptation measures to increase resilience, as discussed in Section 8.4.3.2.1. This covers sections 15(1)(c) and (e) of the Act.

The above measures pursue the furtherance of the national climate objective and the objective of mitigating greenhouse gas emissions and adapting to the effects of climate change in the State as far as practicable as required by section 15(1)(d) and(e) of the Acts.

9.12 References

- ▶ Environmental Protection Agency (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports. Online, <https://www.epa.ie/publications/monitoring--assessment/assessment/guidelines-on-the-information-to-be-contained-in-environmental-impact-assessment-reports-eiar.php>, Accessed February 2026
- ▶ Environmental Protection Agency (2025) National Climate Change Risk Assessment (NCCRA). Online, <https://www.epa.ie/publications/monitoring--assessment/climate-change/national-climate-change-risk-assessment-main-report.php>, Accessed February 2026
- ▶ Environmental Protection Agency (2025b) Ireland's Greenhouse Gas Emissions Projections 2024-2055. Online, <https://www.epa.ie/publications/monitoring--assessment/climate-change/air-emissions/irelands-greenhouse-gas-emissions-projections-2024-2055.php>, Accessed February 2026
- ▶ Environmental Protection Agency (2026) Ireland's Provisional Greenhouse Gas Emissions 1990-2024. Online, <https://www.epa.ie/publications/monitoring--assessment/climate-change/air-emissions/irelands-provisional-greenhouse-gas-emissions-1990-2024.php>, Accessed February 2026
- ▶ European Centre for Medium-Range Weather Forecasts (2023) ECMWF ERA5 data reanalysis. Online, <https://www.ecmwf.int/en/forecasts/dataset/ecmwf-reanalysis-v5>, Accessed February 2026
- ▶ European Commission (2013) Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment. Online, <https://climate-adapt.eea.europa.eu/en/metadata/guidances/guidance-on-integrating-climate-change-and-biodiversity-into-environmental-impact-assessment>, Accessed February 2026
- ▶ European Commission (2017) Environmental Impact Assessment of Projects – Guidance on the Preparation of the Environmental Impact Assessment Report. Online, <https://ppp.worldbank.org/library/guidance-preparation-environmental-impact-assessment-report>, Accessed February 2026
- ▶ European Commission (2019) The European Green Deal. Online, https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en, Accessed February 2026
- ▶ European Commission (2021) EU Adaptation Strategy. Online, https://climate.ec.europa.eu/eu-action/adaptation-and-resilience-climate-change/eu-adaptation-strategy_en, Accessed February 2026
- ▶ European Commission (2021b) Technical Guidance on the Climate Proofing of Infrastructure in the Period 2021-2027. Online, <https://ec.europa.eu/newsroom/cipr/items/722278/en>, Accessed February 2026
- ▶ European Parliament and Council (2014) Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment. Online, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32014L0052>, Accessed February 2026
- ▶ European Parliament and Council (2021) Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999. Online, <https://eur-lex.europa.eu/eli/reg/2021/1119/oj/eng>, Accessed February 2026
- ▶ Government of Ireland (2015) Climate Action and Low Carbon Development Act 2015 (No. 46 of 2015). Online, <https://www.irishstatutebook.ie/eli/2015/act/46/enacted/en/html>, Accessed February 2026
- ▶ Government of Ireland (2021) Climate Action and Low Carbon Development (Amendment) Act 2021 (No. 32 of 2021). Online, <https://www.irishstatutebook.ie/eli/2021/act/32/enacted/en/print>, Accessed February 2026
- ▶ Government of Ireland (2023) Long-Term Strategy on Greenhouse Gas Emissions Reductions. Online, <https://www.gov.ie/en/department-of-climate-energy-and-the-environment/publications/long-term-strategy-on-greenhouse-gas-emissions-reductions/>, Accessed February 2026
- ▶ Government of Ireland (2024) Climate Action Plan (CAP24). Online, <https://www.gov.ie/en/department-of-climate-energy-and-the-environment/publications/climate-action-plan-2024/>, Accessed February 2026

- ▶ Government of Ireland (2024) Second National Adaptation Framework (NAF). Online, <https://www.gov.ie/en/department-of-climate-energy-and-the-environment/publications/national-adaptation-framework-naf/>, Accessed February 2026
- ▶ Government of Ireland (2025) Climate Action Plan (CAP25). Online, <https://www.gov.ie/en/department-of-climate-energy-and-the-environment/publications/climate-action-plan-2025/>, Accessed February 2026
- ▶ Government of Ireland (2025) National Planning Framework (First Revision). Online, <https://www.gov.ie/en/department-of-housing-local-government-and-heritage/publications/national-planning-framework-first-revision/>, Accessed February 2026
- ▶ Institute of Sustainability and Environmental Professionals (2026) Environmental Impact Assessment Guide to: Assessing GHG Emissions and Evaluating their Significance.
- ▶ Institute of Sustainability and Environmental Professionals (2020) ISEP Environmental Impact Assessment Guide to: Climate Change Resilience and Adaptation.
- ▶ Institute of Sustainability and Environmental Professionals (2020) ISEP GHG Management Hierarchy. Online, <https://www.isepglobal.org/articles/ghg-management-hierarchy-updated-for-net-zero>, Accessed February 2026
- ▶ Intergovernmental Panel on Climate Change (2023) AR6 Synthesis Report: Climate Change 2023. Online, <https://www.ipcc.ch/report/ar6/syr/>, Accessed February 2026
- ▶ Limerick County Council (2024) Limerick County Council Climate Action Plan 2024-2029.
- ▶ Limerick County Council (2022) Limerick Development Plan 2022-2028.
- ▶ Met Éireann (2024) TRANSLATE: One Climate Resource for Ireland. Online, <https://www.met.ie/science/translate>, Accessed February 2026
- ▶ The British Standards Institution (2023) Carbon Management in Infrastructure and Built Environment - PAS 2080. Online, <https://www.bsigroup.com/en-GB/insights-and-media/insights/brochures/carbon-management-in-buildings-and-infrastructure/>, Accessed February 2026
- ▶ Transport Infrastructure Ireland (TII) (2022) Transport Infrastructure Ireland (TII) PE-ENV-01104: Climate Guidance for National Roads, Light Rail and Rural Cycleways (Offline & Greenways) – Overarching Technical Document. Online, <https://www.tiipublications.ie/document/?id=3215>, Accessed February 2026
- ▶ Transport Infrastructure Ireland (TII) (2025) Transport Infrastructure Ireland (TII) GE-ENV-01106: TII Carbon Assessment Tool for Road and Light Rail Projects and User Guidance Document. Online, <https://www.tiipublications.ie/document/?id=3219>, Accessed February 2026
- ▶ Transport Infrastructure Ireland (2025a) Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106
- ▶ Transport Infrastructure Ireland (TII) (2025) TII Online Carbon Tool.
- ▶ United Nations (2015) United Nations Paris Agreement. Online, https://treaties.un.org/pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-7-d&chapter=27&clang=_en, Accessed February 2026
- ▶ World Bank Group (2026) Climate Change Knowledge Portal. Online, <https://climateknowledgeportal.worldbank.org/>, Accessed February 2026



RECEIVED: 28/05/2026

Chapter 10 – Noise and Vibration

TABLE OF CONTENTS

10. NOISE AND VIBRATION	10-1
10.1 Introduction.....	10-1
10.2 Methodology	10-1
10.3 Receiving Environment	10-2
10.3.1 Existing/Ambient Noise Survey	10-2
10.4 Associated Noise Characteristics of the Proposed Development	10-6
10.5 Relevant Criteria	10-7
10.5.1 Construction Phase	10-7
10.5.2 Operational Phase.....	10-8
10.5.3 Vibration Criteria	10-10
10.6 Impact Assessments	10-11
10.6.1 Construction Phase	10-11
10.6.2 Operational Phase.....	10-13
10.7 Remedial and Mitigation Measures	10-20
10.7.1 Construction Phase	10-20
10.7.2 Operational Phase	10-20
10.8 Predicted Noise Impact of the Proposed Development	10-21
10.8.1 Construction Phase	10-21
10.8.2 Operational Phase.....	10-21
10.9 Monitoring or Reinstatement Measures	10-21
10.9.1 Construction Phase	10-21
10.9.2 Operational Phase	10-21
10.10 Cumulative Impacts	10-21
10.10.1 Construction Phase.....	10-22
10.10.2 Operational Phase	10-22
10.11 References.....	10-23

LIST OF TABLES

Table 10-1 Fully Attended Survey Periods	10-3
Table 10-2 Partially Attended Survey Periods	10-4
Table 10-3 Attended Survey Results at Noise Sensitive Locations (NSLs) in dB.	10-5
Table 10-4 Partially manned results for nearest proposed dwellings (NML1) in dBs of the partially manned long-term assessment at NML1.	10-6
Table 10-5 Comparative Concurrent Levels Across the Site at NML1 and NML2 in dB.	10-6
Table 10-6 Example Threshold of Significant Effect at Dwellings	10-7
Table 10-7: Likely Impact Associated with Change in Traffic Noise Level	10-8
Table 10-8: ProPG Internal Noise Levels	10-10
Table 10-9: Transient Vibration Impact Criteria for Buildings (Conservative Criteria Below Which There is No Risk of Cometic Damage)	10-11
Table 10-10: Typical Noise Levels Associated with Individual Construction Plant Items	10-12
Table 10-11: Typical Noise Levels Associated with Construction Plant Processes	10-12
Table 10-12: Change in Traffic Noise Levels with Proposed Development - Opening Year	10-14
Table 10-13: Change in Traffic Noise Levels with Proposed Development - Design Year	10-14
Table 10-14: Predicted & Measured Noise Levels at Development Site – NML1	10-15
Table 10-15: Predicted & Measured Noise Levels at Development Site – NML2	10-15

LIST OF FIGURES

Figure 10-1: Noise Monitoring Locations at / around the Proposed Development site	10-5
Figure 10-1: Noise Monitoring Locations at / Around the Proposed Development Site.	10-3
Figure 10-2: ProPG Stage 1 - Initial Noise Risk Assessment	10-9
Figure 10-3: Predicted Existing Noise Contour Across the Site - Daytime	10-16
Figure 10-4: Predicted Existing Noise Contour Across Site - Night-time	10-17
Figure 10-5: Daytime levels across the dwellings on the proposed site 58 – 44dB(A)	10-19

10. NOISE AND VIBRATION

10.1 Introduction

This chapter presents an evaluation of potential significant noise and vibration impacts associated with the proposed Large Residential Development (LRD) located at Singland, Dublin Road, Limerick, Co. Limerick.

This chapter includes a comprehensive description of the existing ambient noise climate in the vicinity of the subject site. It provides an assessment of the potential noise and vibration impacts arising from the Proposed Development during both the short-term construction phase and the long-term operational phase. The assessment considers the potential effects on the surrounding environment as well as on the development itself.

Both direct and indirect noise and vibration impacts have been evaluated, along with any potential cumulative effects in the context of the surrounding area.

Where applicable, mitigation measures are proposed to ensure that the development is constructed and operated in an environmentally sustainable manner, with the objective of minimising adverse noise and vibration impacts on the receiving environment.

The assessment has been carried out with reference to the most appropriate and up-to-date guidance documents relevant to environmental noise and vibration. These documents are cited throughout the chapter and listed in the references section. In addition to specific noise-related guidance, other relevant planning and environmental guidelines were also reviewed and considered in the preparation of this chapter.

This assessment meets the requirements for an EIAR, as outlined in the relevant National and EU legislation, and has been prepared in accordance with the following 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 8233:2024 Guidance on Sound Insulation and Noise Reduction for Buildings;ISO 1996-1:2016 and ISO 1996-2:2017: Acoustics - Description, Measurement and Assessment of Environmental Noise;
- ▶ Association of Noise Consultants (ANC), Institute of Acoustics (IOA) and Chartered Institute of Environmental Health (CIEH) (2017). ProPG: Planning & Noise – Professional Practice Guidance on Planning & Noise: New Residential Development. May 2017;
- ▶ EPA "Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EIAR)" (2022); and
- ▶ TII (formerly NRA) Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes (TII, 2014).

10.2 Methodology

The assessment has been conducted in accordance with the following methodology:

- ▶ Comprehensive baseline noise monitoring was carried out at multiple locations across the development site to establish the existing range of noise levels throughout a full diurnal cycle;

- ▶ A thorough review of the most relevant and applicable published standards and guidance documents was undertaken, to establish appropriate noise and vibration criteria for both the construction and operational phases of the Proposed Development;
- ▶ Predictive noise calculations have been carried out for the construction phase to estimate potential noise and vibration impacts at the nearest noise-sensitive receptors adjacent to the site;
- ▶ Further predictive acoustic modelling was conducted to assess potential noise impacts during the operational phase at the most sensitive locations surrounding the development;
- ▶ An inward noise assessment was performed, developing an acoustic design statement, to evaluate the potential effects of existing environmental noise on the residential amenity within the Proposed Development; and
- ▶ An evaluation of the need for mitigation measures has been undertaken to address and, where necessary, reduce both inward and outward noise and vibration impacts associated with the construction and operation of the Proposed Development.

10.3 Receiving Environment

The Proposed Development site is situated adjacent to the existing Parkway Retail Park on Dublin Road, Limerick. To the East, the site is bordered by open green fields, while mature residential housing estates lie to the South and represent the nearest noise-sensitive receptors to the proposed works. Parkway Retail Park is located directly to the West of the site, and the busy R445 roadway forms the Northern boundary, separating the site from additional commercial developments to the North on the opposite side of the road.

10.3.1 Existing/Ambient Noise Survey

An environmental noise survey was undertaken at the Proposed Development site to quantify the existing acoustic environment. The survey was carried out in general accordance with ISO 1996:2017 – Acoustics: “Description, Measurement and Assessment of Environmental Noise”. Detailed methodology and measurement results are provided in the following sections.

10.3.1.1 Selection of Measurement Positions

Five measurement locations were selected as shown in Figure 10-1 for the site assessment.

Figure 10-1: Noise Monitoring Locations at / Around the Proposed Development Site.



10.3.1.2 Survey Periods

A fully attended noise survey was conducted between the following periods: It consisted of a 15-minute period taken at each NSL location and the proceeding directly on to the next NSL location between the hours listed as outlined in Table 10-1 below.

Table 10-1 Fully Attended Survey Periods

Location	Ref.	Survey Period
Chesterfield Grove	NSL1	Commenced at 12:47 hours on 30/04/25
		Ceased at 09:38 hours on 01/05/25
Oakwood	NSL2	Commenced at 13:06 hours on 30/04/25
		Ceased at 10:04 hours on 01/05/25
Carn Na Rae	NSL3	Commenced at 13:25 hours on 30/04/25
		Ceased at 10:25 hours on 01/05/25

A partially attended noise survey was conducted during the periods outlined in Table 10-2 below. These were continuous uninterrupted periods for both NML1 and NML2.

Table 10-2 Partially Attended Survey Periods

Location	Ref	Survey Period
Dwelling Location	NML1	Commenced at 12:13 hours on 30/04/25
		Ceased at 13:23 hours on 01/05/25
Dwelling Location	NML2	Commenced at 10:40 hours on 01/05/25
		Ceased at 13:07 hours on 01/05/25

The measurement period was selected to provide a representative snapshot of the existing noise climate (a full diurnal cycle), with the primary objective of ensuring that the proposed noise criteria for the development are appropriately aligned with prevailing environmental conditions.

10.3.1.3 Weather Conditions – During Assessment Period

Weather conditions during the survey period were fully suitable for conducting environmental noise measurements. Windspeeds remained below 5M/S, with dry ground conditions, no precipitation, and no evidence of temperature inversion. Ambient temperatures ranged between 9°C and 22°C. Wind direction was predominantly from the southeast, with speeds ranging from 2 to 3 Km/Hr throughout the measurement period.

10.3.1.4 Personnel and Instrumentation

Ted Dalton (Dalton Acoustics Ltd) performed the measurements during the survey periods. Measurements undertaken at positions NSL1, NSL2 and NSL3 were fully manned and witnessed. Measurements at NML1 and NML2 were partially manned.

Attended measurements were made using an NTI XL2 Sound Level Meter. Partially attended measurements (which were witnessed measurements for a proportion of the period), were also made using an NTI XL2 sound Level Meter. Sample periods were 15 minutes for all noise measurements. However, the SLMs were set to 1 second logging with full audio recording for the purposes of post processing on PC Data software.

Before and after the survey the measurement instruments were check calibrated using a Rion NC74 Sound Level Calibrator. All measurement equipment used for this assessment is fully within their respective required calibration dates and certificates are available on request.

10.3.1.4.1 Ted Dalton - Statement of Authority:

In accordance with Article 5(3)(a) of the EU Directive, by appointing Dalton Acoustics Ltd, the applicant has ensured that this chapter has been prepared by Competent experts. Qualifications for Ted Dalton are set out as follows:

- ▶ BSc Surv. (Hons) 1995 – Trinity College
- ▶ Diploma (Hons) in Acoustics & Noise Control 1999 (Institute of Acoustics).
- ▶ MSc (Hons) in Applied Acoustics 2016 (University of Derby).
- ▶ Member of Institute of Acoustics (MIOA) & Member of Irish branch committee (IOA).
- ▶ Secretary and Member of the Association of Acoustic Consultants of Ireland (MAACI).
- ▶ Diploma in Environmental Noise Measurement & Assessment (IOA).
- ▶ 2014 to present: Principal at Dalton Acoustics Ltd.

10.3.1.5 Relevant Acoustic/Measurement Param

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

- ▶ **LA_{eq}** is the equivalent continuous sound level. It is a type of average and is used to describe a fluctuating noise in terms of a single noise level over the sample period.
- ▶ **LA₁₀** is the sound level that is exceeded for 10% of the sample period. It is typically used as a descriptor for traffic noise.
- ▶ **LA₉₀** is the sound level that is exceeded for 90% of the sample period. It is typically used as a descriptor for background noise.
- ▶ **LAF_{max}** is the instantaneous maximum sound level measured during the sample period using the 'F' time weighting.
- ▶ **L_{day}** is the average LA_{eq} noise level measured over the course of the daytime period, defined as 07:00hrs to 19:00hrs.
- ▶ **L_{evening}** is the average LA_{eq} noise level measured over the course of the daytime period, defined as 19:00hrs to 23:00hrs.
- ▶ **L_{night}** is the average LA_{eq} noise level measured over the course of the daytime period, defined as 23:00hrs to 07:00hrs.

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.

10.3.1.6 Survey Results and Evaluation

The results of the surveys at the monitoring locations are summarised in Table 10-3, 10-2 & 10-3 below.

Table 10-3 Attended Survey Results at Noise Sensitive Locations (NSLs) in dB.

Location	Date & Start Time	LA _{eq} (15min)	LAF _{max}	LAF _{min}	LA ₉₀	LA ₁₀
NSL1 at Chesterfield Grove	30/04/25 12:47 hrs	46	59	40	42	49
	30/04/25 13:44 hrs	46	63	39	42	49
	30/04/25 14:43 hrs	45	70	38	40	46
	30/04/25 15:43 hrs	45	60	37	41	48
	30/04/25 16:41 hrs	48	63	38	41	51
	01/05/25 08:21hrs	47	64	39	43	49
	01/05/25 09:23hrs	47	69	37	41	49
Location	Date & Start Time	LA _{eq} (15min)	LAF _{max}	LAF _{min}	LA ₉₀	LA ₁₀
NSL2 at Oakwood	30/04/25 13:06 hrs	49	65	37	42	52
	30/04/25 14:04 hrs	43	62	37	39	45
	30/04/25 15:05 hrs	48	73	34	37	46
	30/04/25 16:03 hrs	43	70	36	38	45
	01/05/25 08:41hrs	51	71	38	41	52
	01/05/25 09:49hrs	46	68	36	40	47
Location	Date & Start Time	LA _{eq} (15min)	LAF _{max}	LAF _{min}	LA ₉₀	LA ₁₀
NSL3 at Carn Na Rae	30/04/25 13:25 hrs	45	61	41	43	47
	30/04/25 14:23 hrs	43	67	39	41	44
	30/04/25 15:24 hrs	44	59	39	41	45
	30/04/25 16:22 hrs	45	69	38	41	46
	01/05/25 09:00hrs	45	54	38	42	46
	01/05/25 10:10hrs	44	53	38	42	46

The partially attended / manned monitoring location (NML1) is subject to traffic noise from the R445 roadway and access traffic to and from the Parkway Retail Park. In order to cross check these levels a concurrent measurement position was setup at NML2 to verify traffic noise levels over the site. There is no direct correlation between noise levels achieved at these 2 positions, however it does confirm that traffic noise levels alone from the R445 onto the site are lower when removing the Parkway Retail Park access traffic contributions.

Table 10-4 below indicates the results of the partially manned long-term assessment at NML1.

Table 10-4 Partially manned results for nearest proposed dwellings (NML1) in dBs of the partially manned long-term assessment at NML1.

Location	Position	Date	Lday	Levening	Lnight
NML1	Nearest proposed dwelling	30/04/2025	55	51	48

Table 10-5 below indicates the 15 minute LAeq concurrently measured samples for **NML1 & NML2** with the level differences between both locations. These show no correlation, but noise levels are lower at **NML2** further away from the Parkway Retail Park entrance. Still **NML2** is dominated by the presence of R445 traffic noise.

Table 10-5 Comparative Concurrent Levels Across the Site at NML1 and NML2 in dB.

Date & Start Time	Period	LAeq NML1	LAeq NML2	Difference
2025-05-01 10:45:00	0:15:00	50.1	47.7	2.4
2025-05-01 11:00:00	0:15:00	49.8	46.7	3.2
2025-05-01 11:15:00	0:15:00	49.0	46.6	1.9
2025-05-01 11:30:00	0:15:00	49.0	47.1	0.3
2025-05-01 11:45:00	0:15:00	49.4	48.7	1.3
2025-05-01 12:00:00	0:15:00	48.9	48.1	0.5
2025-05-01 12:15:00	0:15:00	49.3	48.4	-4.4
2025-05-01 12:30:00	0:15:00	55.4	53.7	2.7
2025-05-01 12:45:00	0:15:00	54.0	52.7	1.3

10.4 Associated Noise Characteristics of the Proposed Development

For a development of this nature, potential noise and vibration impacts on the surrounding environment must be assessed separately for two key stages: the short-term construction phase and the long-term operational phase.

The construction phase will involve activities such as site clearance, demolition of existing derelict structures, building construction, road works, and landscaping. This phase represents the highest potential for noise and vibration impacts on the surrounding area, although these impacts will be limited to a short duration.

During the operational phase, no significant sources of noise or vibration emanating from the development itself are anticipated.

10.5 Relevant Criteria

10.5.1 Construction Phase

At present, there is no official Irish legislation setting out maximum allowable noise and vibration levels during a project's construction phase. As a result, it is common practice to refer to BS 5228:2009+A1:2014 — "Code of Practice for Noise and Vibration Control on Construction and Open Sites", to guide the management of construction-related noise and vibration. For this assessment, suitable construction noise limits have been established based on Part 1 of this standard, which focuses on noise control.

The methodology used involves categorizing noise-sensitive locations into three groups (A, B, or C) based on the ambient noise levels in the area before construction activities begin. This classification sets noise threshold limits, and if these limits are surpassed at any location, it indicates a significant noise impact from construction.

The nearest noise-sensitive receptors to the Proposed Development are residential buildings located about 30 m to the west of the closest development structures.

BS 5228-1:2009+A1:2014 provides various examples of acceptable construction and demolition noise limits, with the most straightforward approach being the comparison of noise levels against fixed limits outlined in Table 10.5. 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.

Example thresholds of significant effects at dwellings are set out in Table 10-6 below.

Table 10-6 Example Threshold of Significant Effect at Dwellings

Assessment category and threshold value period (LAeq)	Threshold value, in decibels (dB)		
	Category ^A	Category ^B	Category ^C
Daytime (07:00 – 19:00) and Saturdays (07:00 – 13:00)	65	70	75
Evenings and Weekends Daytime	55	60	65
Night-time (23:00 to 07:00hrs)	45	50	55

- Category A: Threshold values applied when ambient noise levels, rounded to the nearest 5 dB, are below the specified limits.
- Category B: Threshold values applied when ambient noise levels, rounded to the nearest 5 dB, correspond exactly to the Category A limits.

- c. Category C: Threshold values applied when ambient noise levels, rounded to the nearest 5 dB, exceed the Category A limits.

For the relevant assessment period, which in this case is daytime, the ambient noise level is established and rounded to the nearest 5 dB. Baseline monitoring undertaken as part of this assessment indicates that Category A thresholds are appropriate for the nearest noise-sensitive receptors considered here. If construction noise levels exceed the threshold values corresponding to the assigned category, a significant noise effect is considered to occur. Based on the measured ambient noise, the recommended daytime construction noise limit is set at 65 dB LA_{eq(T)}.

10.5.2 Operational Phase

10.5.2.1 Additional Road Traffic on Public Roads

To assess the potential noise impact from additional traffic generated by the Proposed Development on the existing road network, it is appropriate to evaluate traffic noise using the LA10 parameter, which represents the ten-percentile noise level commonly used for vehicle movement assessments on public roads.

For interpretation purposes, Table 10-7 provides guidance on the expected significance of changes in traffic noise levels, based on the National Roads Authority, Design Manual for Roads and Bridges (DMRB, 2011).

Table 10-7: Likely Impact Associated with Change in Traffic Noise Level

Change in Sound Level (dB LA10)	Subjective Reaction	DMRB magnitude of Impact	EPA Classification Magnitude of Impact
0	Inaudible	No Change	Neutral
0.1 – 2.9	Barely Perceptible	Negligible	Imperceptible
3 – 4.9	Perceptible	Minor	Slight
5 – 9.9	Up to a doubling of loudness	Moderate	Moderate
10+	Doubling of loudness and above	Major	Significant

10.5.2.2 Inward Noise Impact

The Limerick Agglomeration Noise Action Plan (2024 – 2028) refers to the use of the Professional Guidance on Planning and Noise (ProPG) document, released in May 2017, was created by a working group made up of members from the Association of Noise Consultants (ANC), the Institute of Acoustics (IOA), and the Chartered Institute of Environmental Health (CIEH). Although it is not an official government publication, ProPG is widely seen as a best practice guideline and has been widely adopted in Ireland due to the lack of specific national standards.

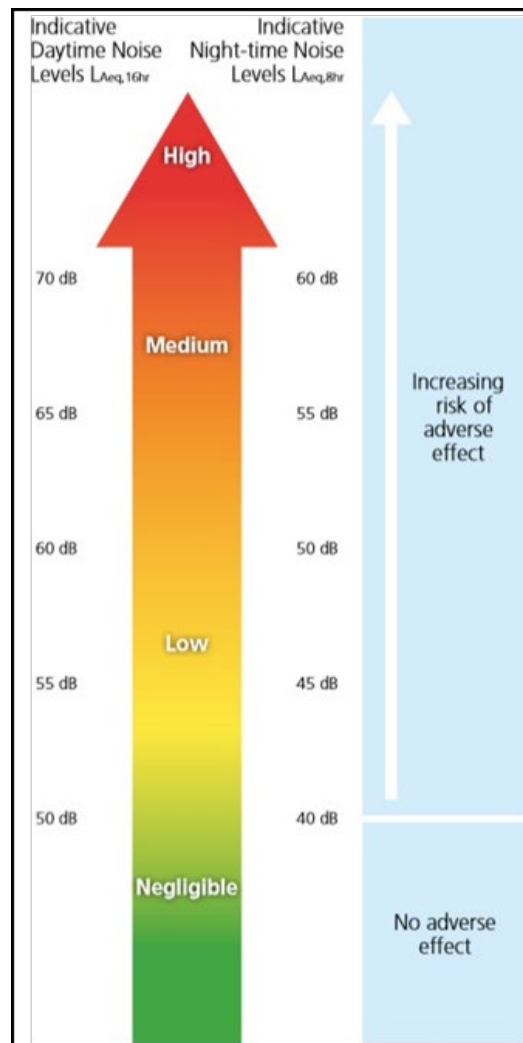
ProPG sets out a systematic, risk-based two-stage approach for assessing noise exposure at prospective residential development sites. The two principal stages can be summarised as follows:

- ▶ Stage 1: A high-level preliminary noise risk assessment of the proposed site, based on either measured or predicted noise levels; and
- ▶ Stage 2: A comprehensive, detailed appraisal of the Proposed Development addressing four “key elements,” including:
 - Element 1 - Good Acoustic Design Process;
 - Element 2 - Noise Level Guidelines;

- Element 3 - External Amenity Area Noise Assessment
- Element 4 - Other Relevant Issues

The initial noise risk assessment is designed to offer an early indication of potential acoustic challenges associated with the site. It requires categorising the site's noise exposure as negligible, low, medium, or high risk, based on the existing noise environment. Figure 10-2 illustrates the framework for this assessment, presenting suitable risk categories corresponding to a range of continuous noise levels, whether measured or predicted on site.

Figure 10-2: ProPG Stage 1 - Initial Noise Risk Assessment



It should be noted that a site cannot be classified as negligible risk if more than 10 LAFmax noise events exceed 60 dB during the night period. Conversely, the site should be considered high risk if LAFmax events exceed 80 dB more than twenty times in a single 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 10-8 and are based on annual average data, that is to say they omit occasional events where higher intermittent noisy events may occur.

Table 10-8: ProPG Internal Noise Levels

Activity	Location	(07:00 to 23:00 hours)	(23:00 to 07:00 hours)
Resting	Living room	35 dB LAeq,16hr	-
Dining	Dining room/area	40 dB LAeq,16hr	-
Sleeping (daytime resting)	Bedroom	35 dB LAeq,16hr	30 dB LAeq,8hr 45 dB LAmax,T*

*Note: ProPG states that the internal LAFmax,T noise level may be exceeded not more than ten times per night without a significant impact occurring.

In addition to specifying absolute internal noise level targets, ProPG offers guidance on the flexibility of these limits. For example, where a development is deemed necessary or desirable but external noise levels exceed recommended guidelines, a relaxation of up to 5 dB in the internal LAeq values may still be acceptable to achieve reasonable internal acoustic conditions. This allowance is based on BS 8233:2014, Subsection 7.7.2, as detailed below:

NOTE 7: Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved.'

ProPG 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 – 55 dB LAeq,16hr.'

10.5.2.3 Outward Noise Impact

For the purposes of this assessment, external noise limits are derived based on the internal criteria outlined in Table 10-8 above. This derivation accounts for the typical noise attenuation provided by a partially open window, which is approximately 15 dB as referenced in the British Standard BS8233: 2014. Applying this correction factor, the corresponding external noise levels required to achieve the internal noise targets listed in Table 10-8 are as follows:

- ▶ Daytime / Evening (07:00 to 23:00 hours) 50 - 55dB LAeq,1hr
- ▶ Night-time (23:00 to 07:00 hours) 45dB LAeq,15min

These noise limits will be applied to all noise sources associated with the Proposed Development, excluding road traffic, such as mechanical plant and equipment serving the development.

10.5.3 Vibration Criteria

10.5.3.1 Construction Phase

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+A1:2014).

These standards distinguish between transient and continuous vibration. Surface construction activities are classified as transient because they occur for a limited time at a specific location. The standards indicate that the risk of cosmetic damage to residential buildings begins at a Peak Particle Velocity (PPV) of 15mm/s at 4Hz. It is also noted that below a PPV of 12.5mm/s, the risk of damage is negligible. Both standards highlight that important buildings that are difficult to repair may need special consideration on a case-by-case basis. However, historical buildings should not automatically be considered more sensitive

unless they are structurally unsound. A building in an unstable condition may be more susceptible to damage from vibration or other ground disturbances. Table 10.7 below outlines the proposed vibration thresholds below which no damage to buildings is expected. These limits apply to vibration frequencies under 15Hz, where stricter limits are necessary. In cases where protected buildings are near construction works, there may be an increased risk of vulnerability compared to modern structures. Therefore, as a precaution, the vibration limits for structurally sound buildings are reduced by 50%, as recommended by the referenced guidance documents.

Table 10-9: Transient Vibration Impact Criteria for Buildings (Conservative Criteria Below Which There is No Risk of Cosmetic Damage)¹

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

10.5.3.1.1 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 (BS 6472-1:2008) and may become disturbing or annoying at higher magnitudes. Higher levels of vibration are acceptable for brief or one-off events, especially during construction projects, provided the source of the vibration is known. For continuous vibration sources like traffic, vibrations become noticeable at around 0.5mm/s (TII - Noise and Vibration Assessment of Proposed National Roads) and can become disturbing or annoying at higher levels. However, short-term or isolated events are typically more tolerable. For example, intermittent activities like blasting and piling, which are common during construction, are usually tolerated at vibration levels of up to 12mm/s and 2.5mm/s, respectively. This guidance applies only during the daytime, as it is unreasonable to expect people to tolerate such activities at night.

10.5.3.2 Operational Phase

No sources of vibration are anticipated during the operational phase; therefore, specific vibration criteria have not been established for this stage.

10.6 Impact Assessments

10.6.1 Construction Phase

The construction programme is expected to generate typical site-related noise associated with various activities. Throughout the construction phase, a range of plant machinery will be employed, including excavators, lifting equipment, dumper trucks, compressors, and generators.

The proposed construction hours are from 07:00 to 18:00, Monday to Friday, and 08:00 to 14:00 on Saturdays.

Given the nature of daytime construction activities, significant noise levels may be generated. Vibration impacts at nearby sensitive receptors are limited to excavation operations and lorry movements over

¹ Source: "Guidelines for the Treatment of Noise & Vibration in National Road Schemes", NRA, 2004

uneven surfaces. Considering the type of works proposed, the likelihood of structural or cosmetic damage to adjacent dwellings from vibration is minimal.

As the construction schedule is currently outlined only in broad terms, precise calculations of noise emissions to the local environment are challenging. Nevertheless, typical noise levels can be predicted using the guidance provided in BS 5228-1:2009+A1:2014. Table 10-10 presents anticipated noise levels for various plant items during different construction phases, referenced at a standard distance of 10 m.

Table 10-10: Typical Noise Levels Associated with Individual Construction Plant Items

Phase	Item of Plant (BS 5228-1:2009+A1:2014 Ref.)	Construction Noise Level at 10m Distance (dB LAeq(1hour))
Site Preparation	Wheeled Loader Lorry (D3 1)	75
	Track Excavator (C2 22)	72
	Dozer (C2.13)	78
	Dump Truck (C4.2)	78
Demolition	Pulveriser on Tracked Excavator (C1.5)	72
	Tracked Crusher (C1.14)	82
	Breaker Mounted on Backhoe (C1.2)	92
	Dump Truck (C4.2)	78
Foundations	Tracked Excavator (C3.24)	74
	Concrete Pump (C3.25)	78
	Compressor (D7 6)	77
	Poker Vibrator (C4 33)	78
General Construction	Hand tools (D7.76)	81
	Tower Crane (C4.48)	76
	Pneumatic Circular Saw (D7.79)	75
	Internal fit – out	70
Landscaping	Dozer (C2.13)	78
	Dump Truck (C4.2)	78
	Surfacing (D8.25)	68

For the purposes of this assessment, it is assumed that standard best practice measures for controlling construction site noise will be implemented. These measures are discussed in greater detail within the mitigation section of this chapter.

Table 10-11 presents the predicted daytime noise levels at the nearest off-site receptor during an indicative construction period. The construction noise sources are assumed to operate for 50% of the time. Predictions are based on a 30-metre distance from the construction activities, representing a worst-case scenario when work is occurring adjacent to the site boundaries closest to existing residential properties.

Table 10-11: Typical Noise Levels Associated with Construction Plant Processes

Construction Phase	Item of Plant (BS 5228-1:2009+A1:2014 Ref.)	BS5228 Reference Levels at 10M (dB)	Predicted at Receiver (30M Distance) dB
--------------------	---	-------------------------------------	---

Site Preparation	Wheeled Loader Lorry (D3 1)	75	62
	Track Excavator (C2 22)	72	59
	Dozer (C2.13)	78	65
	Dump Truck (C4.2)	78	65
	TOTAL SITE PREPARATION		69
Demolition	Pulveriser on Tracked Excavator (C1.5)	72	59
	Tracked Crusher (C1.14)	82	69
	Breaker Mounted on Backhoe (C1.2)	92	79
	Dump Truck (C4.2)	78	65
	TOTAL DEMOLITION		80
Foundations	Tracked Excavator (C3.24)	74	62
	Concrete Pump (C3.25)	78	65
	Compressor (D7 6)	77	64
	Poker Vibrator (C4 33)	78	65
	TOTAL FOUNDATIONS		70
General Construction	Hand tools (D7.76)	81	68
	Tower Crane (C4.48)	76	63
	Pneumatic Circular Saw (D7.79)	75	62
	Internal fit – out	70	57
	TOTAL GENERAL CONSTRUCTION		70
Landscaping	Dozer (C2.13)	78	65
	Dump Truck (C4.2)	78	65
	Surfacing (D8.25)	68	55
	TOTAL LANDSCAPING		68

Construction noise levels are anticipated at times to reach a threshold that may result in a significant impact at the nearest noise-sensitive receptors. It will be necessary at such times to introduce mitigation measures such as a combination of source replacement (seeking out quieter methods of carrying out work), path blocking (introducing high-performance acoustic hoarding or barriers), and operational controls (scheduled periods for carrying out high noise activities), this may result in bringing exceedance down to a negligible or fully compliant level. It should be noted that the predicted noise levels presented in this section are indicative. Additionally, these noise levels are expected to occur only intermittently and affect only a limited number of properties. For the majority of the time and across most properties surrounding the Proposed Development, construction noise levels will be lower than those predicted.

In the direction of the nearest noise sensitive dwellings, vibration impacts during the construction phase are required to comply with the limits set out in Table 10-9.

10.6.2 Operational Phase

10.6.2.1 Associated Additional Road Traffic Noise on Public Roads

A Traffic Impact Assessment for the Proposed Development has been carried out by Punch Consulting Engineers and included in this EIAR. Data from this assessment has been used to estimate the anticipated changes in noise levels from the R445 adjacent the development site for both the opening year and the design year.

To evaluate the potential noise impact, it is important to examine the relative increase in noise caused by traffic on existing roads and junctions, comparing scenarios with and without the Proposed Development. Traffic flow, represented by AADT (Annual Average Daily Traffic) figures, has been analysed, and the resulting changes in noise levels for the opening year and design year are presented in Table 10-13 and Table 10-14.

Table 10-12: Change in Traffic Noise Levels with Proposed Development - Opening Year

Road	Opening Year AADT		Change in Noise Level dB (A)
	Without Development	With Development	
R445 – 602 m from Parkway Roundabout adjacent proposed site	28,300	29,000	<1dB

Table 10-13: Change in Traffic Noise Levels with Proposed Development - Design Year

Road	Design Year AADT		Change in Noise Level dB (A)
	Without Development	With Development	
R445 – 602 m from Parkway Roundabout adjacent proposed site	32,100	32,900	<1dB

The resultant calculated changes in noise levels due to increased traffic flow are considered imperceptible based on dwellings (high sensitivity) and negligible magnitude of change in noise levels as a result of such increases. Thus the <1dB change is considered as neutral (imperceptible) as per Table 3.8.1 (DMRB L.A.104:2020)

10.6.2.2 Mechanical and Electrical Sources Considered

The detailed design information as to the plant suggested for use within the overall development is yet fully known. However, upon full operation of the development, various electrical and mechanical plant systems will be present to service the site and associated commercial buildings. Such plant equipment typically generates noise to varying extents. Certain plant may operate continuously, including overnight periods when ambient noise levels are lower, making their noise emissions more noticeable. Plant with a direct line of sight to noise-sensitive receptors are likely to have the greatest potential impacts. The cumulative effects of noise emanating from all mechanical and electrical plant noise sources shall be required not to exceed the criterion set out within Section 10.5.2.3 for daytime and night-time at the nearest noise sensitive dwellings within the development.

- ▶ Daytime / Evening (07:00 to 23:00 hours) 50 - 55dB LAeq,1hr
- ▶ Night-time (23:00 to 07:00 hours) 45dB LAeq,15min

10.6.2.3 Inward Noise Impact

The dominant external noise influence on the Proposed Development is road traffic on the adjacent R445 corridor to the north. Secondary noise contributions arise from vehicle movements associated with the nearby Parkway Retail Park. These sources define the prevailing acoustic conditions across the site and form the basis of the inward noise assessment.

10.6.2.3.1 Existing Ambient Noise Climate

An environmental noise survey was undertaken at representative monitoring locations, NML1 and NML2. The results indicate daytime noise levels reaching approximately 55 dB LAeq, with evening and night-time levels reducing to around 51 dB LAeq and 48 dB LAeq respectively at the closest proposed residential façades. These findings confirm that road traffic is the primary noise source affecting the site. The results of measurement are summarized in Section 10.3 of this chapter.

To assess the inward noise impact on the proposed noise-sensitive residential units, it is necessary to estimate the internal noise levels within these buildings. These internal levels can then be evaluated against the relevant criteria outlined in BS 8233:2014, as summarized in Section 10.5 (10.6).

Internal noise levels within the proposed residential properties can be calculated by considering the current and anticipated noise environment, the design and construction of the buildings, and the sound insulation properties of building elements such as walls, roofs, and glazing.

10.6.2.3.2 Noise Model of Site

To estimate noise levels across the site, an acoustic model was developed and initially calibrated using on-site noise survey data. Proprietary noise calculation software, INoiseV2024.3, was employed to establish the prevailing noise environment at the Proposed Development. This software computes noise levels based on the specified noise sources in accordance with established methodologies.

The following information was included in the model:

- ▶ Site layout drawings of Proposed Development overlaid onto the existing sites curtilage;
- ▶ Calibrated Google mapping of the site's location.

10.6.2.3.3 Calibration of the INoise Model

Noise levels recorded during the partially attended survey at locations NML1 and NML2 were used to calibrate the acoustic model. Corresponding noise levels were then calculated at these locations using the developed model. The results, presented in Table 10-14 and Table 10-15, cover daytime (07:00 to 19:00), evening (19:00 to 23:00), and night-time (23:00 to 07:00) periods and are compared against the measured onsite data.

Table 10-14: Predicted & Measured Noise Levels at Development Site – NML1

Location	Time Period	Measured Noise Level, dB	Predicted Noise Level, dB
NML1	Daytime	55	54
	Evening	51	51
	Night-time	48	48

Table 10-15: Predicted & Measured Noise Levels at Development Site – NML2

Location	Time Period	Measured Noise Level, dB	Predicted Noise Level, dB
NML2	Daytime	53	53
	Evening	49	48
	Night-time	46	45

10.6.2.3.4 Noise Risk Classification for the Site

In accordance with the methodology set out in ProPG, as detailed in Section 10.5, the acoustic model was utilised to predict noise levels across the site. The results of this assessment are illustrated in Figure 10-3 and Figure 10-4, representing daytime and night-time periods, respectively.

Figure 10-3: Predicted Existing Noise Contour Across the Site - Daytime

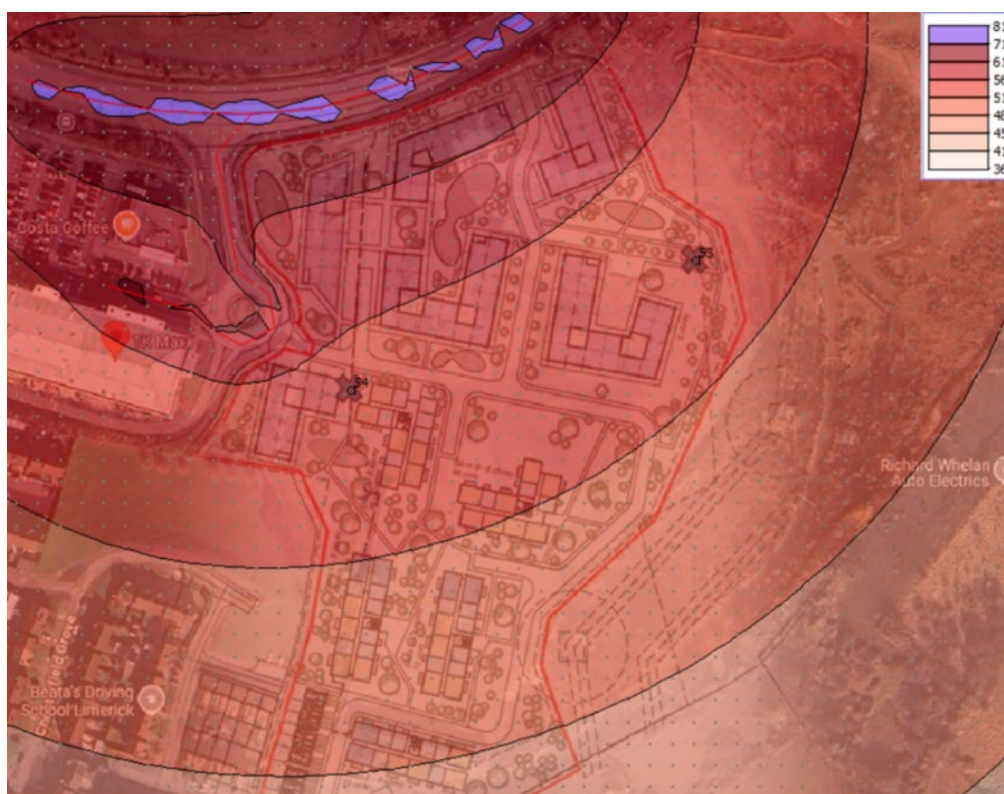
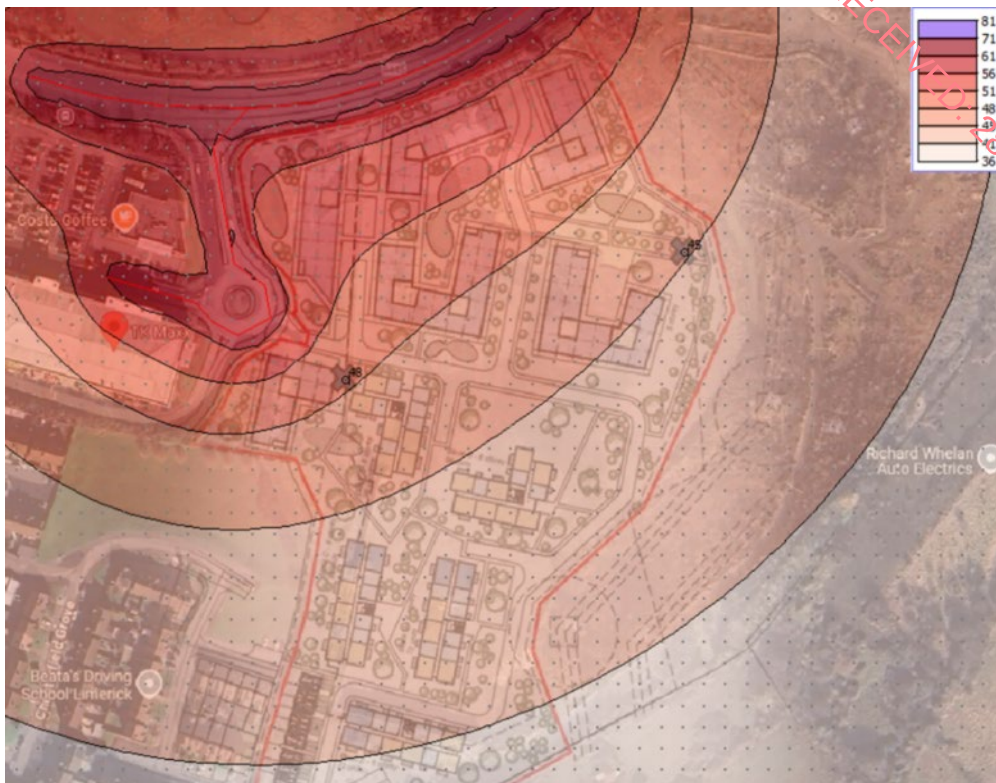


Figure 10-4: Predicted Existing Noise Contour Across Site - Night-time



Please note that Figure 10-3 and Figure 10-4 display the proposed site layout overlaid on the current vacant site. No calculations within these noise models account for the presence of the Proposed Development; these noise contours represent existing conditions on the undeveloped site and serve calibration purposes only.

Calculated road traffic noise levels across the majority of the site—where residential dwellings are proposed—range between 45 and 55 dB LAeq,16hr during daytime periods. Night-time noise levels across the proposed residential areas range from approximately 35 to 48 dB LAeq,8hr. The portion of the site nearest to the R445 roadway experiences higher noise levels, up to 70 dB LAeq; however, this area is designated for commercial development rather than residential use.

Using the ProPG Stage 1 assessment framework, the site is classified as exhibiting a Low to Medium Noise Risk. This classification is based on measured ambient noise levels and the presence of occasional LAFmax events above 60 dB during night-time periods.

Furthermore, the Stage 1 Noise Risk Assessment requires analysis of LAFmax noise events. The Dalton Acoustics Ltd survey recorded no exceedances of 80 dB during night-time hours. However, as per ProPG guidance, a site should not be classified as negligible risk if more than 10 LAFmax events exceed 60 dB during the night. Given that this threshold was exceeded more than 10 times, the site is appropriately classified as low to medium risk according to ProPG criteria.

ProPG states the following with respect to low and medium noise risks:

- ▶ **Low Risk:** At low noise levels, the site is likely to be acceptable from a noise perspective provided that a good acoustic design process is followed and is demonstrated in an ADS which confirms how the adverse impacts of noise will be mitigated and minimised in the finished development.
- ▶ **Medium Risk:** As noise levels rise, the suitability of a site from a noise perspective diminishes. Planning permission may be denied unless a thorough acoustic design process is carried out and

presented through an Acoustic Design Statement (ADS). This statement must clearly outline how noise impacts will be addressed and minimized, ensuring that any significant adverse noise effects are avoided in the final development.

Based on these criteria, the development site is categorized as **Low to Medium Risk**. As a result, an Acoustic Design Strategy is required to ensure that suitable measures are implemented to mitigate and minimize noise impacts, preventing any adverse noise effects in the final development.

It should be noted that ProPG states the following with regard to how the initial site noise risk is to be used,

'2.12 It is important that the assessment of noise risk at a proposed residential development site is not the basis for the eventual recommendation to the decision maker. The recommended approach is intended to give the developer, the noise practitioner, and the decision maker an early indication of the likely initial suitability of the site for new residential development from a noise perspective and the extent of the acoustic issues that would be faced. Thus, a site considered to be high risk will be recognised as presenting more acoustic challenges than a site considered as low risk. A site considered as negligible risk is likely to be acceptable from a noise perspective and need not normally be delayed on noise grounds. A potentially problematical site will be flagged at the earliest possible stage, with an increasing risk indicating the increasing importance of good acoustic design.'

Therefore, following the ProPG guidance does not rule out residential development on sites with medium noise risk. Instead, it highlights the importance of a well-planned design approach to effectively address noise impacts on higher-risk sites. The primary goal of the ProPG framework is to ensure that the best possible acoustic conditions are achieved for each individual development site.

10.6.2.3.5 Façade Noise Levels

Noise levels across the development site have been predicted for both daytime and night-time periods using the established noise model. All proposed residential façades experience noise levels below 55dB LAeq,16hr during the day and 50dB LAeq,8hr at night.

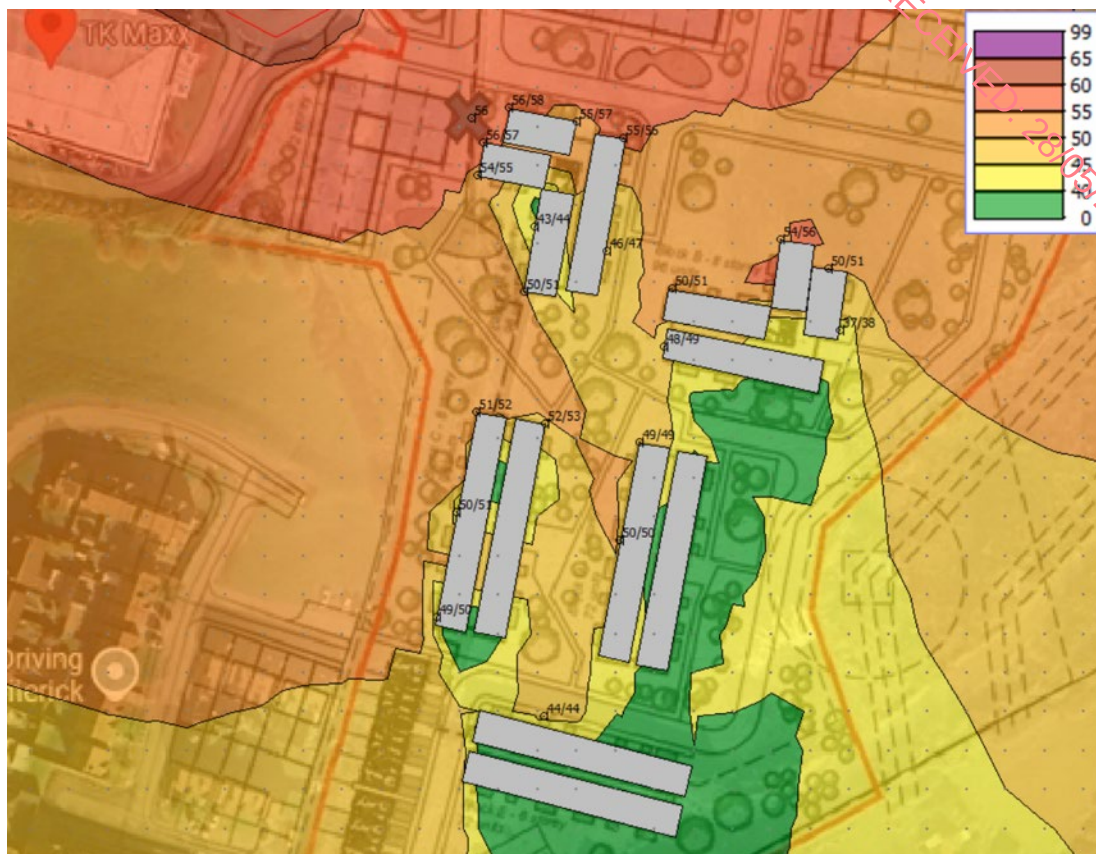
BS8233: 2014 7.7.2 "Internal ambient noise levels for dwellings", NOTE 7 states;

'Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved.'

This indicates that reasonable internal noise conditions can be maintained while allowing for natural ventilation through open windows. For dwellings with façade noise below these thresholds, no additional mitigation measures are necessary.

Figure 10-5 illustrates the proposed dwelling locations on a daytime noise contour map of the site. These dwellings will benefit from additional acoustic shielding provided by the planned commercial buildings closer to the R445 road. However, as the exact design of these commercial buildings is not yet finalized, they have not been included in the INoise model calculations. Consequently, the actual traffic noise levels are expected to be lower than those shown in Figure 10-5. Figure 10-5 does however indicate the attenuation provided across the site by the presence of the proposed domestic dwellings.

Figure 10-5: Daytime levels across the dwellings on the proposed site 58 – 44dB(A)



Noise levels across the site are expected to decrease during the night-time periods, consistent with the values shown in Table 10-14 and Table 10-15.

The Lnight has been measured at 48dB for NML1, representing the nearest proposed dwellings facades to the R445. Lnight is a 7dB reduction on the measured daytime levels from 07:00 hours to 19:00 hours and a 3 dB reduction on the evening time hours of 19:00 to 23:00 hours.

The inward noise assessment demonstrates that, with the application of standard acoustic design measures such as appropriate façade specification, glazing performance, and ventilation strategies, reasonable internal noise conditions may be achieved throughout the proposed residential development. Predicted internal noise levels within the proposed dwellings have been derived from external façade conditions, including scenarios where windows are partially open. These internal levels have been assessed against the criteria set out in BS 8233:2014 and ProPG, which recommend internal noise limits of 35 dB LAeq,16hr for daytime living spaces, 30 dB LAeq,8hr for night-time bedrooms, and 45 dB LAm_{ax}, with limited exceedances considered acceptable. Where applicable BS8233:2014 'Internal Ambient Noise Levels for Dwellings' Note 7 states:

'Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved.'

Therefore, inward noise impacts are considered **not significant** in the context of the EIAR.

10.6.2.3.6 External Noise Levels

External amenity spaces within the development are generally expected to fall within the ProPG desirable guideline range of 50–55 dB LAeq,16hr. Elevated noise levels are primarily confined to areas in closer proximity to the R445, which are not intended to serve as principal amenity areas.

10.7 Remedial and Mitigation Measures

10.7.1 Construction Phase

The construction phase assessment indicates that significant noise and vibration impacts are unlikely. However, the contractor will implement best practice noise and vibration control measures throughout construction to prevent any significant disturbance to the nearest sensitive receptors. These measures will follow the guidelines outlined in BS 5228 (2009 + A1:2014) Parts 1 and 2, covering key mitigation strategies such as:

- ▶ Use and selection of quiet equipment options;
- ▶ All equipment to be properly maintained;
- ▶ Silencers to be used on all plant and machinery where possible;
- ▶ Controlling noise at its source;
- ▶ Limiting the hours of high noise or vibration processes;
- ▶ Continuous noise and vibration monitoring to be employed on site;
- ▶ Installation of screening barriers; and
- ▶ Regular communication with the local community.

During the project's construction phase, some nearby residential properties may occasionally experience temporary noise disturbances caused by on-site operations and vehicle movements to and from the site.

Through enforcement of strict noise limits, monitoring on site, the restriction of working hours, and application of the above listed mitigation strategies, these impacts will be managed with the intention of remaining within acceptable limits.

10.7.2 Operational Phase

10.7.2.1 Additional Traffic on Adjacent Roads

The addition of the Proposed Development on the site is considered to add a negligible amount of vehicular movements when compared to the existing passing traffic numbers on the R445. The predicted additional vehicular traffic as a result of the development proceeding is less than 1% of the vehicular traffic against the development not being present. The resultant is negligible when considering the associated noise implications. Therefore, during the operational phase, no specific noise mitigation measures are required in relation to traffic noise generated by the development. Access to the site will be directly from the R445 roadway, with no vehicular connections to the adjacent residential estates, thereby minimizing traffic noise impacts on those areas.

10.7.2.2 Building Services Plant

Given that the nearest sensitive receptors are within the development itself and closer than any off-site receptors, compliance with the noise criterion outlined in 10.5.2.3 may apply:

- ▶ Daytime / Evening (07:00 to 23:00 hours) 50 - 55dB LAeq,1hr
- ▶ Night-time (23:00 to 07:00 hours) 45dB LAeq,15min

This will ensure that no adverse noise impacts occur at any off-site locations. Consequently, no additional mitigation measures are deemed necessary for building services plant noise.

10.8 Predicted Noise Impact of the Proposed Development

10.8.1 Construction Phase

During the construction phase, temporary / short-term noise, and vibration impacts on nearby noise-sensitive properties, may arise from site activities. The application of enforceable noise limits and restricted hours of operation, combined with the implementation of appropriate noise and vibration control measures previously outlined, will ensure that any noise and vibration impacts are minimized as far as reasonably practicable.

Overall, construction noise and vibration impacts are anticipated to be short-term and / or temporary, ranging from slight to moderate in severity as per Table 10-10.

10.8.2 Operational Phase

The predicted increase in noise levels due to additional traffic is expected to be imperceptible along the existing road network. Within the context of the current noise environment, the overall contribution from induced traffic is considered neutral, imperceptible, and of long-term duration at nearby residential locations.

The impact from any proposed mechanical and electrical plant associated with the new buildings will be required to comply with the daytime and night-time noise criteria set out in Section 10.5.2.3. These metrics prescribed for daytime and night-time include the cumulative noise effects of all proposed mechanical and electrical plant items. As a result, noise generated by building services plant should remain well within the adopted daytime and night-time noise limits at all nearest sensitive receptors. Provided that operational noise levels do not exceed the stated design criteria, the residual noise impact from building services plant will be neutral, imperceptible, and long-term.

10.9 Monitoring or Reinstatement Measures

10.9.1 Construction Phase

The contractor will be required to ensure that construction activities comply with the noise limits established in this assessment. Regular noise monitoring must be conducted at locations representative of the nearest sensitive receptors to verify that the relevant criteria are not exceeded.

Noise monitoring shall be carried out in accordance with the International Standard ISO 1996:2017 – Acoustics “Description, measurement, and assessment of environmental noise.”

10.9.2 Operational Phase

Noise or vibration monitoring is not required once the development is operational.

10.10 Cumulative Impacts

This section considers whether the Parkway Valley development, when taken together with other existing and planned developments in the area, could lead to increased noise or vibration effects. The assessment looks at both the construction and operational phases, alongside established noise sources such as traffic on the R445 and activity within the Parkway Retail Park.

10.10.1 Construction Phase

During construction, there may be potential for cumulative impacts if works on nearby sites take place at the same time. In these situations, noise levels could temporarily increase due to multiple sources operating concurrently, including construction plant and associated traffic. However, these effects would be short-term in nature and heavily rely on attenuation over distance.

A review of foreseeable local development which may overlap in time suggests that such developments are between 500 to 750 m distance from the Parkway Valley development site and nearby identified NSLs, these are considered for study purposes and outside the sphere of influence. Due to attenuation over distance and considering the existing soundscape of this urban location cumulative noise emissions from these localized sites may blend into the background.

With standard mitigation measures in place—such as controlling working hours, using well-maintained equipment, and managing construction traffic—any cumulative impacts during this phase are expected to remain limited and not significant.

Similarly for vibration, developments between 500 m and 750 m are considered negligible as typical vibration levels attenuate much more quickly than airborne noise, unless there are exceptional activities (e.g., blasting, piling in sensitive ground conditions).

10.10.2 Operational Phase

For the operational phase, the main consideration is the combined effect of traffic generated by this and other developments on the surrounding road network, particularly the R445. While each development may only contribute to a slight increase in traffic, the combined effect could lead to a slight rise in overall noise levels. That said, the area is already influenced by existing road traffic, and the additional contribution from the Proposed Development is not expected to materially change the existing noise environment or result in significant adverse effects.

Operational vibration impacts are not anticipated to be significant, either individually or cumulatively, as the proposed domestic development does not include sources typically associated with notable vibration generation, and traffic-related vibration effects are expected to remain negligible at nearby receptors.

Overall, considering the current noise environment, the nature of the Proposed Development, and the use of standard mitigation measures, cumulative noise and vibration effects are not considered to be significant.

10.11 References

- ▶ British Standards Institution (BSI), 2009+A1:2014. *BS 5228-2: Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration*. London: BSI.
- ▶ British Standards Institution (BSI), 2014+A1:2014. *BS 5228-1: Code of practice for noise and vibration control on construction and open sites – Part 1: Noise*. London: BSI.
- ▶ Department for Transport, 1988. *Calculation of Road Traffic Noise (CRTN)*. London: UK Department for Transport.
- ▶ Environmental Protection Agency (EPA), 2022. *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*. Wexford: EPA.
- ▶ International Organization for Standardization (ISO), 2013. *ISO 1996-1: Acoustics — Description, measurement, and assessment of environmental noise — Part 1: Basic quantities and assessment procedures*. Geneva: ISO.
- ▶ International Organization for Standardization (ISO), 2017. *ISO 1996-2: Acoustics — Description, measurement, and assessment of environmental noise — Part 2: Determination of environmental noise levels*. Geneva: ISO.
- ▶ Transport Infrastructure Ireland (TII), 2014. *Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes*
- ▶ World Health Organization (WHO), 2018. *Environmental Noise Guidelines for the European Region*. Copenhagen: WHO Regional Office for Europe.



RECEIVED: 28/05/2026

Chapter 11 – Townscape and Visual Impact

TABLE OF CONTENTS

11. TOWNSCAPE AND VISUAL IMPACT	11-1
11.1 Introduction	11-1
11.1.1 Approach and Statement of Authority	11-1
11.2 Methodology	11-1
11.2.1 Scope of the Assessment	11-2
11.2.2 Forecasting Methods and Difficulties Encountered	11-2
11.2.3 Study Area	11-2
11.2.4 Townscape Impact Assessment Criteria	11-4
11.2.5 Visual Impact Assessment Criteria	11-5
11.2.6 Significance of Effect	11-8
11.3 Receiving Environment	11-9
11.3.1 Townscape and Visual Policy Context and Designations	11-9
11.3.2 Townscape Baseline	11-14
11.3.3 Visual Context	11-18
11.4 Characteristics of the Proposed Development	11-18
11.5 Potential Impacts of the Proposed Development	11-18
11.5.1 Assessment of Receptor Sensitivity – Townscape	11-18
11.5.2 Assessment of Receptor Sensitivity – Visual	11-19
11.5.3 Magnitude of Townscape Effects - Construction Phase	11-19
11.5.4 Magnitude of Visual Effects - Construction Phase	11-20
11.5.5 Magnitude of Townscape Effects - Operational Phase	11-20
11.5.6 Magnitude of Visual Effects - Operational Phase	11-21
11.6 Mitigation Measures	11-31
11.6.1 Construction Phase	11-31
11.6.2 Operational Phase	11-31
11.7 Monitoring or Reinstatement Measures	11-31
11.7.1 Construction Phase	11-31
11.7.2 Operational Phase	11-31
11.8 Residual Effects of the Proposed Development	11-31
11.9 Cumulative Impacts of the Proposed Development	11-32
11.10 References	11-36

LIST OF TABLES

Table 11.1 Townscape Value and Sensitivity	11-5
Table 11.2 Magnitude of Change - Visual	11-7
Table 11.3 Significance Matrix	11-8
Table 11.4 Operational Phase Visual Effects	11-23
Table 11.5 Magnitude of Change - Visual	11-32

LIST OF FIGURES

Figure 11.1 1km Extent of the Study Area (Open Street Map)	11-3
Figure 11.2 1km Extent of the Study Area (Aerial Photography)	11-4
Figure 11.3 1km Extract from Limerick City and Suburbs Zoning Map	11-9
Figure 11.4 Extract from LDP Map 3.6 Tall Buildings at City Level	11-12
Figure 11.5 Aerial view of the site in relation to the adjacent townscape (c/o Google Earth)	11-16
Figure 11.6 Historic 6 inch Map (1837 to 1842)	11-17

11. TOWNSCAPE AND VISUAL IMPACT

11.1 Introduction

This Townscape and Visual Assessment (TVIA) has been prepared to accompany a planning application for an LRD development that comprises 5 no. blocks with a total of 403 no. residential units, ranging from 5 to 8 storeys in height; a medical centre located at the western edge of the site; a creche located at ground level within Block B; and all associated site works and development. The current LRD development proposals also extend to the R445 to accommodate a proposed entrance from the R445. They will also include a proposed nature based surface water drainage solution within the neighbouring Groody Valley green wedge.

This TVIA describes the townscape context of the Proposed Development and assesses the likely townscape and visual impacts of the scheme on the receiving environment. Although closely linked, townscape and visual impacts are assessed separately.

- ▶ Townscape Impact Assessment (TIA) relates to assessing effects of a development on the Townscape as a resource in its own right and is concerned with how the proposal will affect the elements that make up the townscape, the aesthetic and perceptual aspects of the townscape and its distinctive character.
- ▶ Visual Impact Assessment (VIA) relates to assessing effects of a development on specific views and on the general visual amenity experienced by people. This deals with how the surroundings of individuals or groups of people may be specifically affected by changes in the content and character of views as a result of the change or loss of existing elements of the townscape and/or introduction of new elements. Visual impacts may occur from; Visual Obstruction (blocking of a view, be it full, partial or intermittent) or; Visual Intrusion (interruption of a view without blocking).

11.1.1 Approach and Statement of Authority

This TVIA adopts an approach that is founded in the following best practice guidance documents:

- ▶ Landscape Institute and the Institute of Environmental Management and Assessment (IEMA) publication entitled Guidelines for Landscape and Visual Impact Assessment, 2013 (GLVIA3);
- ▶ Environmental Protection Agency (EPA) publication 'Guidelines on the Information to be contained in Environmental Impact Assessment Reports (2022)'; and
- ▶ 'Photography and Photomontage in Landscape and Visual Impact Assessment', Landscape Institute Technical Guidance Note 06/2019.

11.2 Methodology

This document uses methodology as prescribed in the previously mentioned GLVIA3. Given the site's context, this is principally a 'townscape' assessment, albeit the assessment utilises the same outline methodology as would be employed for the more familiar Landscape and Visual Impact Assessment (LVIA) of developments in rural settings.

GLVIA3 follows the European Landscape Convention (ELC) definition of landscape:

'Landscape is an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors' (Council of Europe, 2000). Thus, GLVIA-2013 covers all landscapes from "high mountains and wild countryside to urban and fringe farmland (rural landscapes), marine and coastal landscapes (seascapes) and the landscapes of villages towns and cities (townscapes)" - whether protected or degraded.

Townscape is defined in GLVIA3 in the following manner (section 2.7):

'Townscape' refers to areas where the built environment is dominant. Villages, towns and cities often make important contributions as elements in wider-open landscapes but townscape means the landscape within the built-up area, including the buildings, the relationships between them, the different types of urban spaces, including green spaces, and the relationship between buildings and open spaces. There are important relationships with historic dimensions of landscape and townscape, since evidence of the way the villages, towns and cities change and develop over time contributes to their current form and character.

In the context of 'townscape' it is recognised that there is a strong interrelationship between the 'townscape' and 'cultural heritage' assessments. As stated in section 5.11 of GLVIA;

"the sharing of relevant baseline information should not be confused with the need for separate cultural heritage appraisals such as historic landscape characterisation and assessment of historic townscape appraisal, or there will be a danger of both double handling and inappropriate judgements by non-experts. It is particularly important that responsibilities are clear in considering any effects on the settings and views for historic buildings, conservation areas and other heritage assets."

The identification of heritage assets in this assessment is made to indicate the value and quality of the wider townscape character as well as provide an indication of areas from which views are potentially more sensitive to change.

11.2.1 Scope of the Assessment

GLVIA3 establishes guidelines and not a specific methodology. The preface recognises that:

'This edition concentrates on principles and processes. It does not provide a detailed or formulaic 'recipe' that can be followed in every situation – it remains the responsibility of the professional to ensure that the approach and methodology adopted are appropriate to the task in hand.'

The methodology for this assessment has therefore been developed specifically for this assessment to ensure that it is appropriate and fit for purpose. The TVIA Methodology can be summarised as undertaking the following key tasks:

- ▶ Desk study and site visits in September 2025;
- ▶ Defining the Baseline Landscape setting and conditions;
- ▶ Identification and Evaluation of key components of the Proposed Development;
- ▶ Consideration of Mitigation Measures;
- ▶ Assessment of Landscape Effects;
- ▶ Assessment of Visual Effects; and
- ▶ Summary Statement of Significance.

11.2.2 Forecasting Methods and Difficulties Encountered

There is a roadside hoarding currently in place along the Dublin Road to the northeast of the site which limits the understanding of foreground context in photomontage views from that section of road. Otherwise, there were no particular difficulties encountered in the assessment of Townscape and Visual effects.

11.2.3 Study Area

The Proposed Development is contained within the urban / peri-urban context of Limerick City where the key consideration is its influence on townscape and visual amenity within the immediate vicinity. With this

in mind, and considering the general diminishment of effects over distance, a proportionate focus is placed on the townscape within approximately 1km of the development and this will be the extent of the study area in this instance. (refer to Figure 11.1).

Figure 11.1 1km Extent of the Study Area

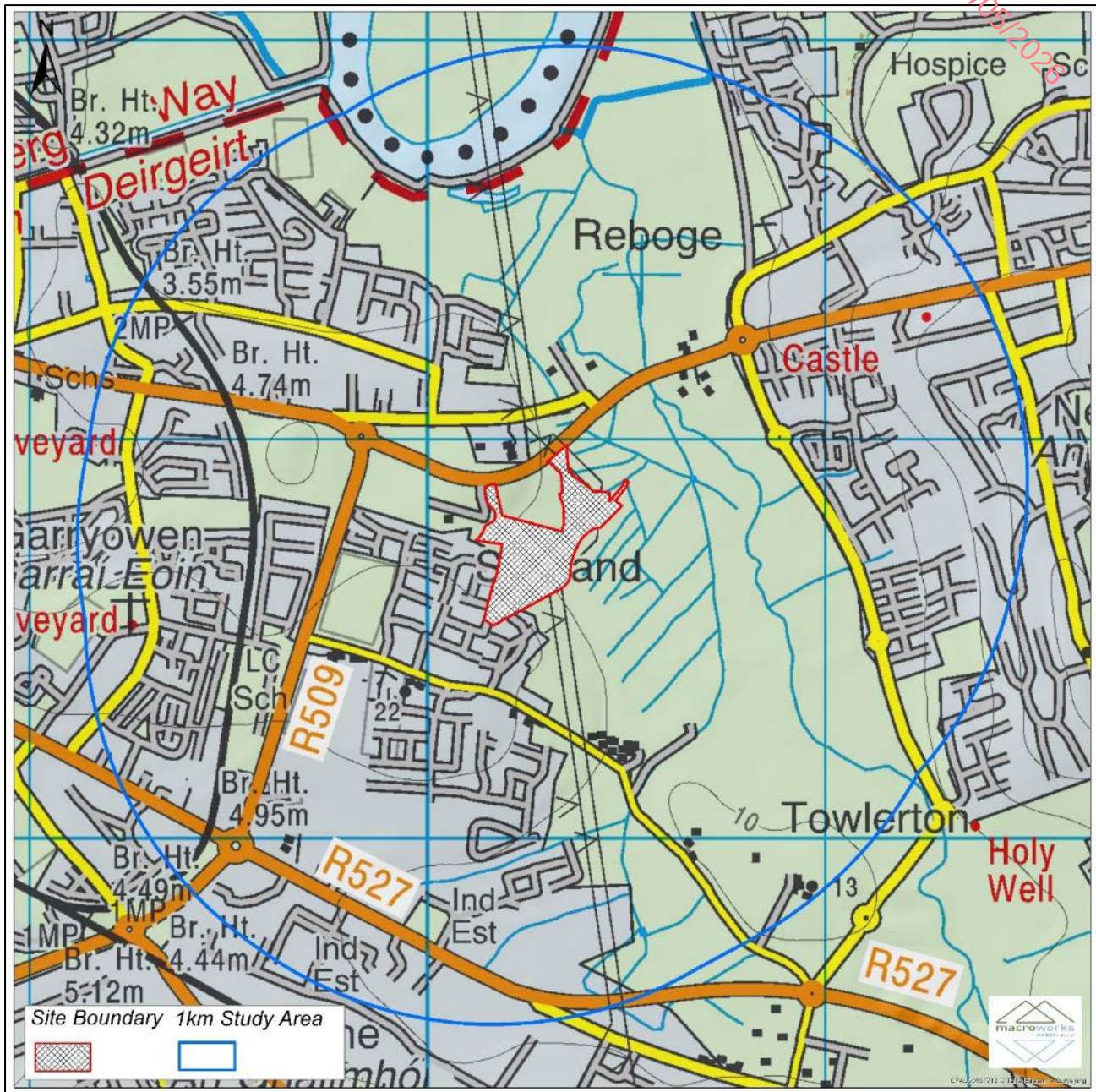


Figure 11.2 1km Extent of the Study Area (Aerial Photography)



11.2.4 Townscape Impact Assessment Criteria

This part of the TVIA provides an assessment of how the introduction of the Proposed Development will affect the physical features and fabric of the townscape, and then how the proposals influence townscape character with reference to published descriptions of character and an understanding of the contemporary character of the townscape as informed through desktop and site studies.

When assessing the potential townscape effects of the development, the value and sensitivity of the townscape receptor is weighed against the magnitude of impact to determine the significance of the townscape effect. Criteria outlined below are used to guide these judgements.

11.2.4.1 Townscape Sensitivity

The sensitivity of the townscape to change is the degree to which a particular setting can accommodate changes or new elements without unacceptable detrimental effects to its essential characteristics. In accordance with GLVIA3, the sensitivity of a townscape receptor (Townscape Character Area or feature) is derived from combining judgements in relation to its susceptibility to change and its value. The judgement reflects such factors as its quality, value, contribution to townscape character and the degree to which the particular element or characteristic can be replaced or substituted. Townscape Sensitivity is classified using the following criteria set out in Table 11.1.

Table 11.1 Townscape Value and Sensitivity

Sensitivity	Description
Very High	Areas where the townscape character exhibits a very low capacity for change in the form of development. Examples of which are high value townscapes, protected at an international or national level (World Heritage Site/National Park), where the principal management objectives are likely to be protection of the existing character.
High	Areas where the townscape character exhibits a low capacity for change in the form of development. Examples of which are high value townscapes, protected at a national or regional level where the principal management objectives are likely to be considered conservation of the existing character.
Medium	Areas where the townscape character exhibits some capacity and scope for development. Examples of which are townscapes, which have a designation of protection at a county level or at non-designated local level where there is evidence of local value and use.
Low	Areas where the townscape character exhibits a higher capacity for change from development. Typically, this would include lower value, non-designated townscapes that may also have some elements or features of recognisable quality, where townscape management objectives include, enhancement, repair and restoration.
Negligible	Areas of townscape character that include derelict sites and degradation where there would be a reasonable capacity to embrace change or the capacity to include the development proposals. Management objectives in such areas could be focused on change, creation of townscape improvements and/or restoration.

11.2.5 Visual Impact Assessment Criteria

This part of the TVIA provides an assessment of how the introduction of the Proposed Development will affect views within the townscape. It therefore needs to consider:

- ▶ Direct impacts of the Proposed Development upon views through intrusion or obstruction;
- ▶ The reaction of viewers who may be affected, e.g. residents, walkers, road users; and
- ▶ The overall impact on visual amenity.

It has been deemed appropriate to structure the assessment around a series of representative viewpoint locations. All viewpoints are located within the public domain and are representative of views available from main thoroughfares and pedestrian areas within the vicinity of the Proposed Development. The selected viewpoints are considered to be comprehensive in communicating the variable nature of the visual effects.

When assessing the potential visual effects of the development, the sensitivity of the visual receptor is weighed against the magnitude of the visual impact to determine the significance of the visual effect. Criteria outlined below are used to guide these judgements.

11.2.5.1 Sensitivity of Visual Receptors

As with townscape sensitivity, the sensitivity of a visual receptor is categorised as Very High, High, Medium, Low, and Negligible. Unlike townscape sensitivity however, the sensitivity of visual receptors has an anthropocentric (human) basis. It considers factors such as the perceived quality and values associated with the view, the townscape context of the viewer, the likely activity the viewer is engaged in and whether this heightens their awareness of the surrounding environment.

A list of the factors considered by the assessor in estimating the level of sensitivity for a particular visual receptor is outlined below to establish visual receptor sensitivity at each viewpoint location.

11.2.5.2 Susceptibility of Visual Receptors to Change

In accordance with GLVIA3, visual receptors most susceptible to changes in views and visual amenity are:

- ▶ "Residents at home;
- ▶ People, whether residents or visitors, who are engaged in outdoor recreation, including use of public rights of way, whose attention or interest is likely to be focussed on the townscape and on particular views;
- ▶ Visitors to heritage assets, or to other attractions, where views of the surroundings are an important contributor to the experience;
- ▶ Communities where views contribute to the townscape setting enjoyed by residents in the area;
- ▶ Travellers on road rail or other transport routes where such travel involves recognised scenic routes and awareness of views is likely to be heightened".
- ▶ Visual receptors that are less susceptible to changes in views and visual amenity include;
- ▶ "People engaged in outdoor sport or recreation, which does not involve or depend upon appreciation of views of the townscape;
- ▶ People at their place of work whose attention may be focussed on their work or activity, not their surroundings and where the setting is not important to the quality of working life".

11.2.5.3 Value attached to Views

The value attached to a view is determined by considering the following:

- ▶ Recognised scenic value of the view (Development Plan designations, guidebooks, touring maps, postcards etc). These represent a consensus in terms of which scenic views and routes within an area are strongly valued by the population because in the case of County Development Plans, for example, a public consultation process is required;
- ▶ Views from within highly sensitive townscape areas. These are likely to be in the form of Architectural Conservation Areas, which are incorporated within the Development Plan and therefore subject to the public consultation process. Viewers within such areas are likely to be highly attuned to the townscape around them;
- ▶ Primary views from residential receptors. Even within a dynamic city context, views from residential properties are an important consideration in respect of residential amenity;
- ▶ Intensity of use, popularity. This relates to the number of viewers likely to experience a view on a regular basis and whether this is significant at a national or regional scale;
- ▶ Provision of vast, elevated panoramic views. This relates to the extent of the view on offer and the tendency for receptors to become more attuned to the surrounding townscape at locations that afford broad vistas;
- ▶ Sense of remoteness and/or tranquillity. Receptors taking in a remote and tranquil scene, which is likely to be fairly static, are likely to be more receptive to changes in the view than those taking in the view of a busy street scene, for example;

- ▶ Degree of perceived naturalness. Where a view is valued for the sense of naturalness of the surrounding townscape it is likely to be highly sensitive to visual intrusion by distinctly manmade features;
- ▶ Presence of striking or noteworthy features. A view might be strongly valued because it contains a distinctive and memorable townscape / townscape feature such as a cathedral or castle;
- ▶ Historical, cultural and / or spiritual significance. Such attributes may be evident or sensed by receptors at certain viewing locations, which may attract visitors for the purposes of contemplation or reflection heightening the sense of their surroundings;
- ▶ Rarity or uniqueness of the view. This might include the noteworthy representativeness of a certain townscape type and considers whether the receptor could take in similar views anywhere in the broader region or the country;
- ▶ Integrity of the townscape character. This looks at the condition and intactness of the townscape in view and whether the townscape pattern is a regular one of few strongly related components or an irregular one containing a variety of disparate components;
- ▶ Sense of place. This considers whether there is special sense of wholeness and harmony at the viewing location;
- ▶ Sense of awe. This considers whether the view inspires an overwhelming sense of scale or the power of nature.

Those locations which are deemed to satisfy many of the above criteria are likely to be of higher sensitivity, and no relative importance is inferred by the order of listing.

It is recognised that a viewer's interpretation and experience of the townscape can have preferential and subjective components. Where relevant, judgements are made on those elements of the townscape that are considered to contribute more prominently and positively to the visual townscape resource as well as those elements that contribute negatively. Overall sensitivity may be a result of a number of these factors or, alternatively, a strong association with one or two in particular.

11.2.5.4 Magnitude of Change - Visual

The magnitude of change is again a product of the scale, extent, or degree of change that is likely to be experienced as a result of the Proposed Development. This is directly influenced by its 'visual presence / prominence', as experienced by visual receptors in the townscape. These terms are somewhat quantitative in nature, and essentially relate to how noticeable or 'dominant' the proposal is within a particular view. Aside from the obvious influence of scale and distance, a development's visual presence is influenced by the extent and complexity of the view, contextual movement in the townscape, the nature of its backdrop, and its relationship with other focal points or prominent features within the view. It is often, though not always, expressed using one of the following terms: Minimal; Sub-dominant; Co-dominant; Dominant; Highly dominant. Criteria used to inform judgements are provided in Table 11.3.

Table 11.2 Magnitude of Change - Visual

Criteria	Description
Very High	Complete or very substantial change in view, dominant, involving complete or very substantial obstruction of existing view or complete change in character and composition of baseline, e.g., through removal of key elements.
High	A major change in the view that is highly prominent and has a strong influence on the overall view. This may involve the substantial obstruction of existing views or a complete change in character and composition of baseline, e.g. through removal of key elements or the introduction of new features that would heavily influence key elements.

Criteria	Description
Medium	Moderate change in view: which may involve partial obstruction of existing view or partial change in character and composition of baseline, i.e., pre-development view through the introduction of new elements or removal of existing elements. Change may be prominent but would not substantially alter scale and character of the surroundings and the wider setting. View character may be partially changed through the introduction of features which, though uncharacteristic, may not necessarily be visually discordant.
Low	Minor change in baseline, i.e. pre-development view - change would be distinguishable from the surroundings whilst composition and character would be similar to the pre change circumstances.
Negligible	Very slight change in baseline, i.e. pre-development view - change would be barely discernible. Composition and character of view substantially unaltered.

11.2.6 Significance of Effect

The significance of a townscape or visual effect is based on a balance between the sensitivity of the receptor and the magnitude of change, and is categorised as Profound, Substantial, Moderate, Slight, or Imperceptible. Intermediate judgements are also provided to enable an effect to be more accurately described where relevant. 'No Effect' may also be recorded as appropriate where the effect is so negligible it is not noteworthy.

The significance category judgement is arrived at using the Significance Matrix at Table 11.4 as a guide. This applies the principle of significance being a function of magnitude weighed against sensitivity but employs slightly different terminology that avoids the potentially confusing use of the term 'significant' (as recommended by GLVIA3 Statement of Clarification 1/13 (Landscape Institute, 10th June 2013)).

Indicative criteria descriptions used in relation to the significance of effect category are presented at Table 11.5.

Table 11.3 Significance Matrix

	Sensitivity of Receptor				
Magnitude	Very High	High	Medium	Low	Negligible
Very High	Profound	Profound-substantial	Substantial	Moderate	Slight
High	Profound-substantial	Substantial	Substantial-moderate	Moderate-slight	Slight-imperceptible
Medium	Substantial	Substantial-moderate	Moderate	Slight	Imperceptible
Low	Moderate	Moderate-slight	Slight	Slight-imperceptible	Imperceptible
Negligible	Slight	Slight-imperceptible	Imperceptible	Imperceptible	Imperceptible

11.3 Receiving Environment

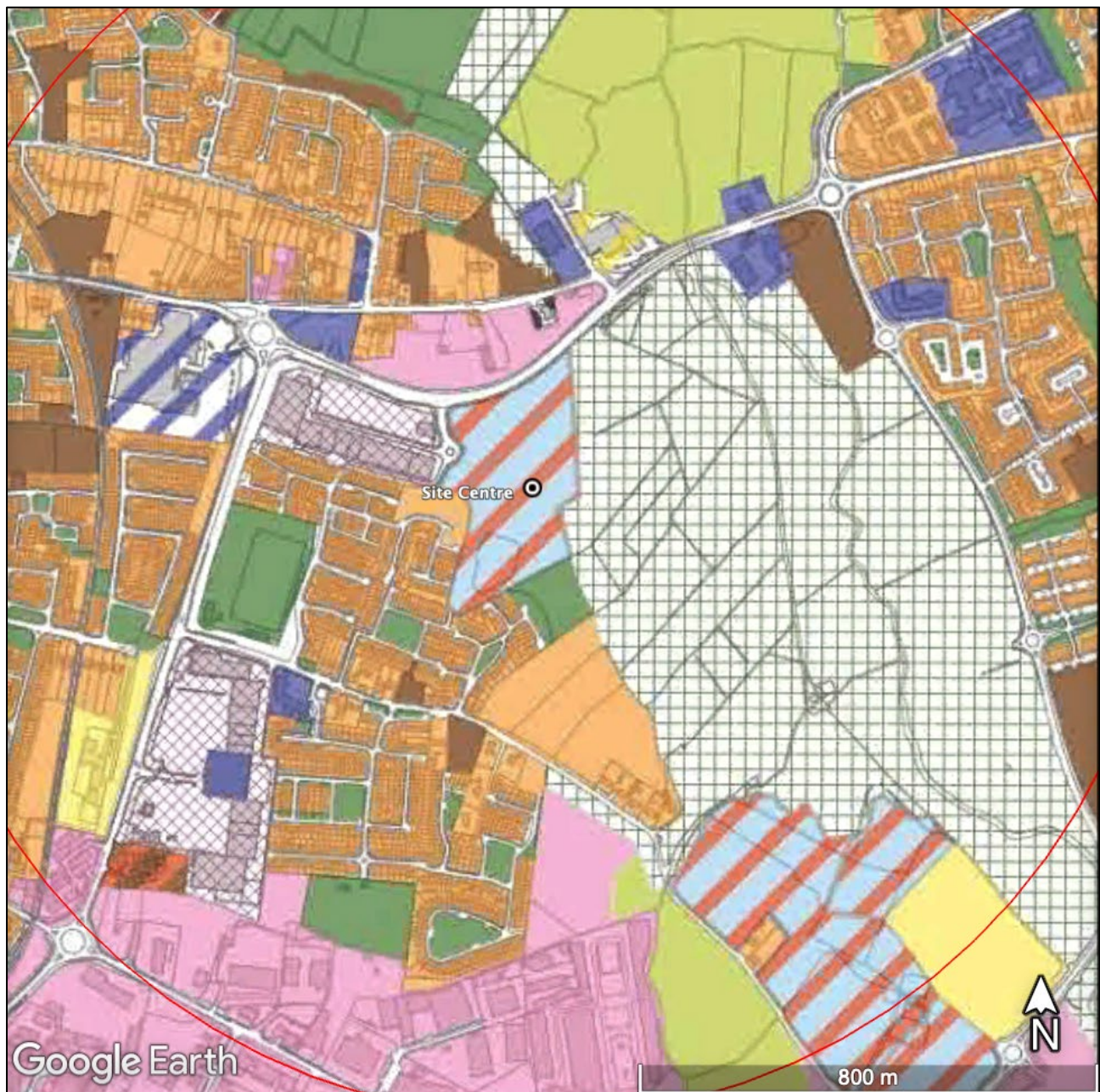
11.3.1 Townscape and Visual Policy Context and Designations

11.3.1.1 Limerick County Development Plan 2022-2028

The site is subject to the land use policies and objectives of the Limerick County Development Plan (LDP) 2022-2028. The LDP provides a framework to guide future development within the county and accordingly contains many policy objectives that deal with strategic planning issues.

The site is zoned for Mixed Use as shown in Figure 11.3 below.

Figure 11.3 1km Extract from Limerick City and Suburbs Zoning Map



LEGEND

 Agriculture	 High Tech/Manufacturing	 Semi Natural Open Space
 City Centre	 Campus	 Special Control Area
 Data Centre	 Industrial	 Sports Arena
 District Centre	 Local Centre	 Traveller Specific Accommodation
 Education and Community Facilities	 Mixed Use	 University
 Enterprise and Employment	 New Residential	 Utilities
 Existing Residential	 Open Space and Recreation	 Limerick City and Suburbs, including Mungret and Annacotty Boundary
 Groody Valley Green Wedge	 pNHA	
	 Retail Warehousing	

Under Chapter 3 of the LDP, Objective PV 01 Parkway Valley states:

The former Horizon Mall brownfield site of 16.04ha. comprising a mixed-use zone is located adjacent to the Parkway Retail Park in the townland of Singland. The vision for development of these lands will be focused on the creation of a high-quality environment in terms of design and layout, a mixture of functions, tenure types, unit sizes and the provision of a broad range of on-site facilities for employees. The principal uses shall be for employment creation. A range of other uses are considered open for consideration but are seen as ancillary to the primary use as an employment zone. An element of residential use may be considered, where the Proposed Development makes a positive contribution to the area in terms of adding to the richness and diversity of uses. The retail needs of the area are being sufficiently met by the adjoining retail parks and shopping centres and the provision of retail development will not be permitted.

It is an objective of the Council to:

Require preparation of a masterplan by a suitable qualified person, with accompanying design statements showing how the design concepts are consistent with the following principles:

i) Demonstrating the internal organisation of land uses, amenities and the layout of each block, the detailed design of individual buildings and spaces, including private and collective amenity areas, hard and soft landscaping, materials, finishes, street furniture, signage and lighting. Finishes, materials and heights shall be consistent with the overall development of the site.

ii) Given the strategic location of the site on the R445 Dublin Road, there is potential for landmark buildings.

iii) The purpose of the link street is to improve connectivity within the area and the layout, location and design of new streets/roads will be determined at planning application stage.

Support development of the area as a major employment centre with supporting facilities such as crèches and amenity areas for employees and visitors. A high standard of urban design will be required throughout the site in order to create a high- quality environment with a defined sense of place, functionally and physically connected to the existing and permitted development on surrounding lands.

Support development of a civic square and streets with active frontage. The public realm will be characterised by a high standard of finishes and treatments. A network of high-quality spaces formed by the highest quality of buildings, paving and landscaping is required. Architecturally designed buildings and open plazas, using high quality finishes will define civic spaces.

Development shall be double fronted and shall address the Groody Park, the Dublin Road and streets and civic spaces within the development.

Ensure a sufficient mix of uses, including a maximum of 48% of development for residential use, which shall be appropriately integrated with other development on site to create a successful mixed-use development.

Encourage the use of underground parking, which shall be sensitively located and adequately screened.

Ensure provision of a network of pedestrian and cycle routes through the lands linked to the Groody Valley Green Wedge. Details of these linkages will be required in the masterplan.

Enable access via one entry point only along the R445 Dublin Road, with potential for a new access point to link with the Tipperary Road.

Ensure adequate provision of social and community facilities within the site, to serve existing and future residents. Provision shall be made for childcare facilities, playground and facilities suitable for a range of age groups including walking paths and community meeting space.

It should be noted that there is currently a proposed variation to the Limerick County Development Plan (Draft Variation 3) out for submissions, which has specific relevance to the Parkway Valley masterplan area. This variation includes a revised Objective PV 01, which allows for a greater proportion of the Parkway masterplan area to be utilised for residential development. The main change is to Design Principle (i), which now states;

(i) Residential development shall constitute the primary use on site and the masterplan shall identify the layout of each block, the detailed design of individual buildings and spaces, including private and collective amenity areas, hard and soft landscaping, materials, finishes, street furniture, signage and lighting. Finishes and materials shall be consistent across the whole site.

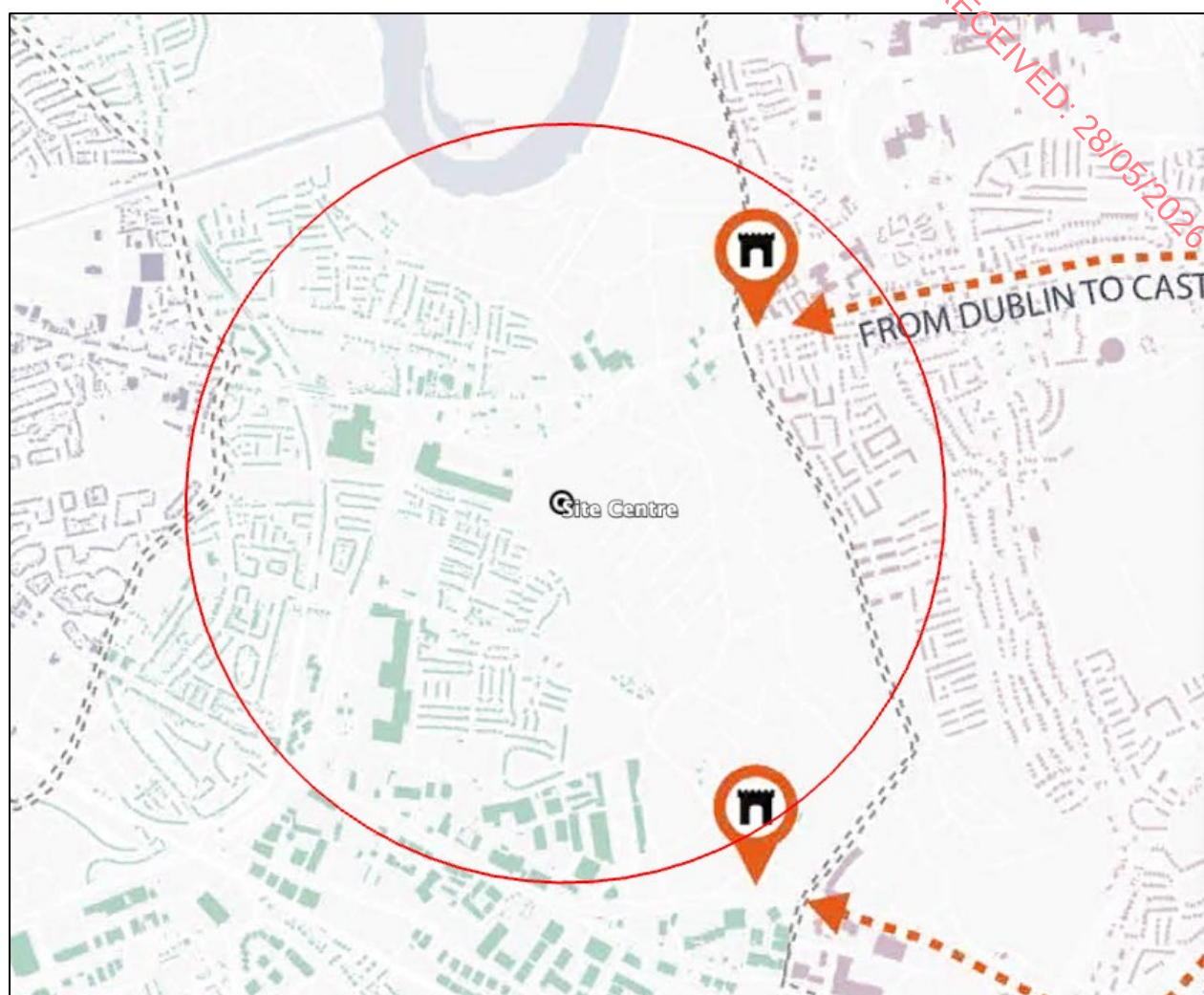
Further, design principle (i) (d) removes reference to a maximum of 48% residential development and now states;

Ensure a sufficient mix of uses, which shall be appropriately integrated with the residential development on site to create a successful mixed-use development.

11.3.1.2 LDP Urban Character Areas

The LDP defines the site as a gateway location between the Castletroy / University Gateway Urban Character Area (UCA) to the east and the Surrounding Suburban UCA to the west as shown in Figure 11.4 below.

Figure 11.4 Extract from LDP Map 3.6 Tall Buildings at City Level



The relevant character points and objectives for the UCAs within the 1km study area are:

- ▶ Infill and brownfield development patterns to be favoured
- ▶ River Groody Green Wedge to be retained
- ▶ Building Height Strategy to inform design of higher buildings

Whilst it is acknowledged that the LDP contains policy objectives that deal with many design and environmental considerations, those that are considered to be of particular relevance to townscape and visual issues are as follows:

Policy EH P8- Landscape/Townscape Character Areas

"It is a policy of the Council to promote the distinctiveness and where necessary safeguard the sensitivity of Limerick's landscape types, through the landscape characterisation process in

accordance with the Draft Guidelines for Landscape and Landscape Assessment (2000) as issued by the Department of Environment and Local Government, in accordance with the European Landscape Convention (Florence Convention) and with A National Landscape Strategy for Ireland – 2015- 2025. The Council shall implement any relevant recommendations contained in the Department of Arts, Heritage and the Gaeltacht's National Landscape Strategy for Ireland, 2015 – 2025."

Objective EH O31- Views and Prospects

"It is an objective of the Council to:

a) Preserve, protect and encourage the enjoyment of views and prospects of special amenity value or special interests and to prevent development, which would block or otherwise interfere with views and/or prospects.

b) In areas where scenic views and prospects are listed in the Plan, there will be a presumption against development, except that required to facilitate farming and appropriate tourism and related activities. The development must be appropriately designed so that it can be integrated into the landscape."

11.3.1.3 County Scale Landscape Character Assessment

The National Landscape Strategy for Ireland 2015-2025 emphasizes the importance of understanding, protecting, managing, and planning landscapes by integrating landscape character assessments into decision-making processes. It advocates for the development of National and Regional Landscape Character Maps and Strategies. Below that is the Landscape Character assessment contained within the Limerick County Development Plan 2022-2028. Landscape character types are distinct types of landscape that are relatively homogenous in character. They are generic in nature in that they may occur in different localities throughout the City and County. At the county scale the site is located within the landscape character area defined as 'City' with the land immediately east of the site located within the character area defined as 'Castletroy'. The relevant objectives for the county scale character areas are:

- ▶ Infill and brownfield development patterns to be favoured
- ▶ River Groody Green Wedge to be retained

11.3.1.4 Limerick's Building Height Strategy Document (LBHSD)

The LBHSD is found in Volume 6 of the LDP. The site is defined in the LBHSD as the Parkway Valley Site opportunity area :

The former Horizon Mall brownfield site of 16.04ha is located adjacent to the Parkway Retail Park in the townland of Singland. The vision for development of these lands will be focused on the creation of a high quality environment in terms of design and layout, a mixture of functions, tenure types, unit sizes and the provision of a broad range of on-site facilities for employees.

Employment creation is a principal use for this site, with a range of other uses open for consideration, ancillary to the primary use as an employment zone. Due to the sites strategic location along the R445 Dublin Road, it is recognised that there is potential for increased building heights and that a masterplan which indicates building heights to include landmark buildings should be provided in any planning application made on this site.

The strategy states (p120):

Tall Buildings – Impact on Strategic Views

Due to their massing, scale and height, tall buildings can impact on and detract from strategic views and prospects. As Limerick City has a relatively flat topography, elevated views are limited. The River Shannon, as the entrance to the City from the west and as a space that allows for wider views of the City Centre, is especially sensitive because of the panoramic views it offers.

The impact of tall buildings on a particular view can be established through a visual impact assessment and by the use of verified views. While a tall building may impact a view, the nature of this impact can range from positive, to neutral or to harmful and therefore, needs to be examined.

It is recognised that there are important viewpoints around the City such as the River Shannon and other panoramic views from vantage points both inside and outside the City, with three different view types identified i.e. linear views of landmark buildings, the City Walks and City skyline; river prospects; and approach road views. The impact of a tall building proposal on such views will need to be considered to avoid any negative visual impact or the situation where a tall building competes with an existing local landmarks, for example King John's Castle.

The key vantage points into Limerick City are described as being of "strategic significance and special amenity value viewed by large numbers of people". They can also be views appreciated within a local context that are important to the character and legibility of areas within the city. The Proposed Development is within the viewshed of two of the four views listed:

- ▶ Westerly view from Annacotty Áth na Choite, Co. Limerick (Key Vantage Point 3), approximately 4.3km from the site.
- ▶ North-westerly view Ballyneety, Baile an Fhaoitigh, Co. Limerick (Key Vantage Point 4), approximately 4.1km from the site.

Neither vantage point is located within the 1km study area. Given the urban context, zoning, distance of view, and the relatively modest height, scale and massing of the proposals, the resultant visual effects arising from the proposals on these views are considered negligible and these are therefore scoped out of this TVIA.

In relation to local landmarks, key linear views, localised views and views towards the River Shannon, the site does not figure in those contained within the LBHSD.

11.3.2 Townscape Baseline

The townscape baseline represents the existing townscape context and is the scenario against which any changes to the townscape brought about by the Proposed Development will be assessed. A description of the townscape context of the proposed application site and wider study area is provided below under the headings of landform and drainage, vegetation and land use, centres of population and houses, transport routes and public amenities and facilities. Although this description forms part of the townscape baseline, many of the townscape elements identified also relate to visual receptors i.e. places and transport routes from which viewers can potentially see the Proposed Development. The visual resource will be described in greater detail in 11.3.3.

11.3.2.1 Landform and Drainage

The study area and wider townscape is composed of relatively flat terrain for the most part albeit the Groody River and minor valley landform including floodplain lie to the immediate east of the site. Topography on the eastern valley flanks of the Groody rises to approximately 30m AOD at the highest

point within the 1km study area. To the west of the Groody the highest point is approximately 20m AOD. The valley floor is approximately 8m AOD in the south of the study area. In the most northerly part of the study area the Groody meets the River Shannon and there is a broader floodplain at approximately 5m AOD.

The site has been previously developed with concrete retaining walls and development platforms cut into the east facing valley flanks. The majority of the site is generally flat, ranging from 8.4 to 9.64m AOD with a small parcel of land at 17m AOD in the south of the study area. There are steep banks around the edges of the site where the landform has been graded back. The northeastern parts of the site extend onto the valley floor at 5m AOD.

Figure 11.5 Aerial view of the site in relation to the adjacent townscape



11.3.2.2 Transport Routes

The site is well connected to public transport corridors, with access to bus routes 304 and 304A along Dublin Road that serve the area and connect it to Limerick city centre and the University of Limerick, University Hospital, retail parks and the train station. The area is well-connected by roads, with the R445 to the immediate north of the site being a strategic route running east - west. Other important roads include Bloodmill Road which is part of a strategic connection to recently developed mixed uses within the opportunity areas in the study area. There are also designated cycling routes in and around the study area, facilitating bicycle commuting and leisure cycling for residents, the closest of these is approximately 100m to the north of the site at its closest point

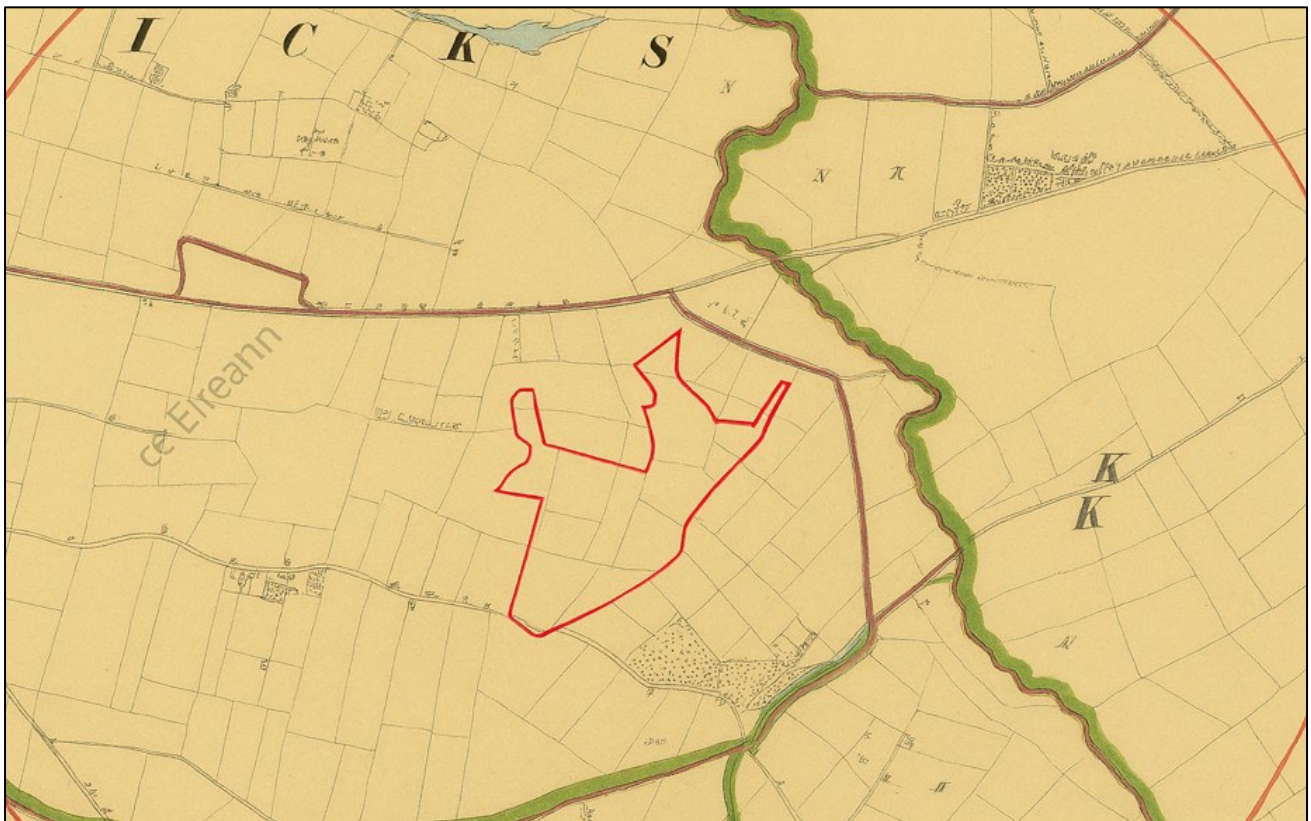
11.3.2.3 Public Amenity and Heritage Features

There are few archaeological and architectural features present in the study area that are open to the public / attract visitors (visual receptors). The only notable of which are Dromroe House and Glanleam House located approximately 850m and 950m to the northeast of the proposed site. The study area includes the local sports club Cloughaun GAA pitch which lies approximately 200m southwest of the site. There are pocket of amenity green space consisting of grassland and occasional trees within the residential area to the west and southwest of the site. There is evidence in satellite imagery of walking routes within the Groody Valley to the east of the site. There is a walking trail along the Shannon in the northern extent of the study area.

11.3.2.4 Historical Context of Study Area

The historic and cultural relevance of the site and the wider landscape is dealt with in specific detail within the Cultural Heritage Assessment. However, consideration is given to cultural associations that have influenced the townscape evolution and patterns that are evident in today's townscape character.

Figure 11.6 Historic 6-inch Map (1837 to 1842)



The site formed part of a wider agricultural landscape as shown in Figure 11.6 above. There were no notable settlements or clusters of built form in the vicinity of the site albeit the original course of the Dublin Road can be discerned to the north of the site.

The majority of the built form in the study area appears to date from the 20th century. Through analysis of 21st century aerial photography, it is clear that the landscape surrounding the site has continued to change as a result of continued development pressure and urban expansion.

Land use within the study area is varied with approximately 50% residential, 25% undeveloped floodplain, 15% commercial/retail and the remainder infrastructure and industrial. There is a distinct area of

landscape change within the Towlerton opportunity area to the south-east of the site where new built form and infrastructure is being provided as part of planned change.

11.3.3 Visual Context

Given the concentration of built development in the townscape surrounding the site, views towards the site are restricted from many locations in the wider study area. Views of the site are generally contained within the immediate streetscape of residential development within approximately 500m of the site boundary.

There are two notable view typologies relevant to the site: channelled and cross-valley views. Channelled views of the site occur east-west along Dublin Road and north-south along the Overhead lines passing through the site. Cross-valley views occur from the east facing valley flanks of the Groody Valley.

Whilst the study area placed a proportionate focus on the townscape within approximately 1km of the site, it is likely that the Proposed Development would be most visible and influential on views within around 500m of the site given the presence of other built form, vehicular movement, activity associated with the surrounding residential landcover, and other characteristics of the townscape. Beyond this distance, views of the development would be partial and part of a broad and diverse urban skyline.

11.4 Characteristics of the Proposed Development

Full details of the Proposed Development, and its architectural design, can be found in the supporting Architectural Design Statement. The design of the proposals has been subject to an iterative design approach, with contextual analysis underpinning the proposals ensuring that careful consideration has been given to the receiving townscape.

The proposals have sought to deliver a varied, contemporary development in line with the ambitions for this urban area, and capitalise on the development potential of the gateway site. The architectural design of the buildings, has also sought to respond positively to the urban characteristics of the surrounding area.

The layout of the apartment blocks allows space for landscaping including raised podiums. In addition to making the internal areas of the development human-scale and inviting, the generous gaps between blocks allows for physical and visual permeability through the site and breaks up the massing. This is aided by considered modulation of heights and massing and variety in the elevation and façade treatments including articulation, colouration and materiality. This provides both visual interest and variation that supports strong placemaking.

11.5 Potential Impacts of the Proposed Development

11.5.1 Assessment of Receptor Sensitivity – Townscape

In accordance with Section 5.5 of the GLVIA-2013, a townscape character assessment requires a particular understanding of, among other criteria, "the context or setting of the urban area and its relationship to the wider landscape."

The brownfield site is zoned for a mixed use gateway site with access onto Dublin Road. There is an opportunity for redevelopment of the site and the achievement of policy PV 01 of the LDP. Currently the vacant site has a confusing identity with no sense of place and reads as an underachieving gateway and visual detractor.

In terms of the wider area of townscape, it comprises a broad mix of building types, heights, and characteristics. The neighbouring Singland residential area lies to the immediate south-west of the site

and there is a retail park to the northwest. The strategic route to the immediate north is the main townscape contributor to gateway character. The Groody Valley to the immediate east of the site contributes to a transitional and peri-urban character of the local townscape.

The site and local townscape have a complex mixed character due to the juxtaposition of built and natural influences. There is a transitional character due to ongoing change including the recent construction of new areas of townscape to the immediate south-east of the site along Bloodmill Road.

The local townscape does not contain elements of a recognisable recreational and heritage value at a local level albeit it is noted that the Groody Valley has greenway potential and may currently be used for informal recreation. The local townscape has a functional and visual connection to the River Shannon to the north via the Groody Valley green corridor. The local valley landform is distinct from the wider topography of Limerick that is broadly flat. Local character is influenced by a variety of land uses including energy with high voltage overhead lines and pylons immediately east of the Site.

There is undoubtedly capacity and scope for development of the site. This is supported by the mixed use zoning of the site that promotes a larger scale and intensity of development as well as quality of design and placemaking for this strategic site. Nonetheless, the prevalence of residential properties in the surrounding area generates some sensitivity to taller built form in the immediate surrounds of the site. Given the reasons presented above, the townscape sensitivity of the site and its immediate context (<100m) is deemed to be of Low sensitivity due to its brownfield condition and underlying zoning, whilst the surrounding study area is considered to be of Medium-low sensitivity containing occasional higher sensitivity features.

11.5.2 Assessment of Receptor Sensitivity – Visual

All of the viewpoints are located within a visually contained urban area, with a key differential in visual receptor sensitivity relating to whether or not the viewpoint represents residential receptors or people travelling along residential streets or located within other parts of the surrounding townscape.

In terms of visual receptor sensitivity, it is noted that the site is located in an extensively urban context where visual receptors are influenced by a mix of built forms of various heights and architectural characteristics, including residential terraces and extensive low and mid-rise commercial/industrial premises. This urban context is also set within a busy road network, the audible and visual influence of which is notable at a local level. There are not considered to be any particularly notable or important panoramic views present, and the townscape does not appear to be valued for its scenic qualities.

On the basis of the factors outlined above, visual receptor sensitivity is generally considered to range between Medium-low and Low. Specific receptor sensitivity is assigned to each viewpoint using the factors outlined in methodology.

11.5.3 Magnitude of Townscape Effects - Construction Phase

During the construction stage, construction-related activity within and around the site, and nearby approach roads is anticipated. This will include, but is not limited to:

- ▶ Site preparation works and groundwork operations;
- ▶ Intrusive foundation work including the installation of foundations and services;
- ▶ HGVs transporting materials to and from the site;
- ▶ Movement of heavy machinery on-site;
- ▶ Presence of tower cranes
- ▶ Temporary storage of demolition debris/construction materials on-site;
- ▶ Security fencing/hoarding and site lighting.

Construction phase effects will be at their greatest when the apartment blocks emerge above the surrounding existing buildings, but remain veiled in the temporary clutter of scaffolding and dust/debris sheets and surrounded by tower cranes. Construction work on sites throughout this wider urban area is a common feature, albeit the scale of construction associated with this development will be more akin to a city centre site.

In terms of townscape character, construction activities tend to not to be strongly associated with townscape detriment as they are temporary/short term and transient (relates to different sites at different times) and can be associated with positive progression and / or rejuvenation. Notwithstanding, during the construction period of this substantial urban project within an outer suburb of the city, the partially completed development combined with intense activity and movement of machinery will detract from the character of the immediate townscape.

Construction stage impacts on landscape/townscape character will be 'short-term' (i.e. lasting 1-7 years), in accordance with the EPA definitions of impact duration.

Based on the reasons outlined above, the magnitude of construction stage impact is deemed to be High in the immediate context of the site, which when combined with the Low sensitivity assigned to this portion of the study area is deemed to result in no greater than a Moderate significance of townscape effect, albeit of a Negative quality. The Medium-low sensitivity of the receiving townscape of the surrounding study area (>100m from site), combines with a reducing magnitude of impact of High-medium such that the significance of effect will also not be greater than Moderate / Negative and will continue to reduce with increased distance and broader context.

11.5.4 Magnitude of Visual Effects - Construction Phase

Effects during construction will be highly variable depending on the activity taking place, the angle of the view, and the degree to which the activity would be visible. Visual effects will arise as a result of the highly visible construction-related machinery, views of fencing/hoarding, site lighting and temporary structures, and movement associated with the intensity of activity at the site. They will also relate to the emergence of the partially completed structures draped in dust sheets and scaffolding and surrounded by tower cranes.

Construction phase visual effects are an inevitable consequence of the development proposal being brought forward, and there are a range of standard best practice construction management measures able to moderate these during construction.

Construction stage visual effects will be most noticeable in the immediate landscape/townscape setting of the site, and key approach roads where increased construction traffic volumes may also be noticeable. The highest magnitude of construction stage visual impacts will occur when the site is at its peak of construction activity and the main structures have emerged but are incomplete and draped / surrounded by construction related paraphernalia and temporary structures. The scale and intensity of these construction stage effects will have a detrimental effect on visual amenity, but this is only a short-term impact (1-7 years).

Based on the reasons outlined above, the magnitude of visual impact is deemed to be High for visual receptors immediately surrounding the site and reducing with increased distance and visual context. When combined with the Medium-low and Low sensitivity of the visual receptors within the near context, the overall significance of effect is considered to be no greater than Moderate / Negative. Accordingly construction stage visual impacts are assessed as Not Significant.

11.5.5 Magnitude of Townscape Effects - Operational Phase

Following the completion of the proposed works, townscape impacts will relate entirely to the development's impact on the character of the receiving townscape and whether this is positive or negative.

The most notable impact in this regard will result from the permanent presence of the new mixed use apartment blocks rising well above the surrounding built context, together with public realm enhancements within and around them.

The Proposed Development includes varied and contextually derived architectural design and finishes, that enhance the character of the road frontages and local townscape of the site in a manner that is promoted by the underlying 'Mixed Use' zoning. The bulk and massing has a strong horizontal emphasis and it is assessed that this will function as an anchor and complement future tall buildings along Dublin Road to the immediate north of the proposals where a strong gateway character is required to achieve LDP policies.

The buildings provide a sense of place and identity within the local townscape. The proposed permeability of the site for non-motorised users will result in further positive townscape effects and assist in the achievement of planning policies and strategies including those associated with recreational activity in the Groody Valley.

The Proposed Development will generate the most notable influence on the immediate area of townscape, where it will be most visible, and the prominence of the apartment blocks will be most notable. Beyond the 1km radius study area, although potentially visible, the influence of the development reduces and it is perceived as part of the wider cityscape, where other prominent features are also influential on urban character. In this regard the taller and more intensive form of the development stands in strong contrast to its surroundings and will substantially alter the townscape character. However, this contribution, aside from being of generally greater intensity and scale, is generally of a more varied design and materiality than is currently present within the prevailing 20th century development of Singland.

The most fundamental change in a townscape sense is that the Proposed Development will assist in repairing the urban fabric, notably the brownfield void represented by this site, which is currently an underutilised and detracting townscape element. It takes the opportunity provided by the strategic gateway location of the site and presents a carefully considered infill development that has the potential to be vibrant and improve sense of place and identity. In this regard, it represents a marked change and considerable uplift in scale and intensity of development, but one that makes a welcome contribution to the placemaking of a gateway site

Based on the reasons outlined above, the magnitude of townscape impact is deemed to be High within the immediate context of the site. When combined with the Low sensitivity of the site and its immediate surrounds, the overall significance of effect is considered to be Moderate and Positive. With greater distance and broader context the magnitude of townscape impact will reduce and the quality of the change will remain positive due to the provision of a positive landmark capable of supporting an eventual cluster of taller gateway buildings.

11.5.6 Magnitude of Visual Effects - Operational Phase

The assessment of visual impacts is based on a series of representative viewpoints and the assessment at each of the selected viewpoints is aided by photomontages of the Proposed Development. Photomontages are a 'photo-real' depiction of the scheme within the view, utilising a rendered three-dimensional model of the development, which has been geo-referenced to allow accurate placement and scale.

Summer views have been presented and an assessment is made as to whether seasonality is material to the overall visual assessment, but on the basis that the most visible scenario is most relevant to the assessment of potential significant effects. Due to the timeline of the project and the iterative process of the final viewpoint selection, it has not been possible to capture winter photography. It is important to note that the GLVIA3 (2013) guidelines do not require a separate assessment of summer and winter views, only an acknowledgment of whether effects are likely to materially differ across seasons.

Representative assessment viewpoints seek to reflect a range of different receptor types, distances and orientations, to help to inform the conclusions being made. Where views are precluded by built form and

vegetation, they seek to demonstrate the absence of visibility. 16 viewpoints were selected and are detailed in Table 11.4 and illustrated in the verified views (Appendix 11.1). It is not warranted to include every location that provides a view towards the Proposed Development as this would result in an unwieldy report and make it extremely difficult to draw out the key impacts arising from the Proposed Development.

For each of the representative viewpoints, an existing (baseline) view is presented, together with a Photomontage that superimposes the Proposed Development within the view. Cumulative views are also included thereafter showing the general massing of potential Phase 2 development within the Parkway Valley masterplan area. Photomontages provide a 'photo-real' depiction of the scheme within the view utilising a rendered three-dimensional model of the development, which has been geo-referenced to allow accurate placement and scale. Where there is no visibility of the Proposed Development, an outline view has been produced to illustrate where the Proposed Development lies relative to intervening screening.

Table 11.4 Operational Phase Visual Effects

	Existing view	Sensitivity	Description and Magnitude of Visual impact	Significance
VP1	The north-westerly view consists of a recently constructed road and associated infrastructure in the foreground with grassland and a retail unit beyond. Bare patches of earth, embankments and overhead powerlines are visual detractors. For the majority of the view there is a relatively close-range horizon beyond the sweeping curve of the new road. The skyline consists of vegetation within the Groody River Valley, glimpses of roofscape, and hills in County Clare in the background. The site is approximately 835 m distant, beyond a well vegetated vegetation.	Medium-low	The upper parts of the proposals would be a noticeable component of the view, appearing in the mid distance as a coherent new townscape element as part of planned change. The modulated heights do not provide sufficient articulation to the roofline such that the massing reads as bulky with a strong horizontal emphasis. The vertical colouration pattern breaks up the massing and provides necessary vertical expression to the appearance. The black coloured elements at the tops of the buildings strike a discordant tone. At this distance, the changes to the scene are quite subtle. Whilst the proposals obscure landform in the distant background the overall mixed character of the view would remain and overall, the proposals offer neither an improvement nor deterioration to the existing view. Overall, the magnitude of visual impact is deemed to be Low. The quality of the effect is neutral.	Slight / Neutral / Permanent
VP2	This is a view from an internal road in a newly constructed housing estate on the valley flanks of the River Groody. This estate is situated just off the local road - Bloodmill Road. This view will be experienced by residents and visitors to the housing area, users of the public open space, cyclists and road users. The northerly view towards the site takes in housing fronting onto public open space beneath an overhead lines corridor with a glimpse of hills in County Clare in the far distance. The houses on the right side of the photograph are located on lower lying land compared to those on the left. There is a cycleway running through the open space. Most of the houses are two story high and there is one four story apartment block present on the right side of the photograph.	Medium-low	The proposals would appear against the background sky in the midground and in the context of the existing overhead line corridor. The colours and the material finishes are in harmony with the housing on both sides of the open space. There are some negative effects due to the bulky horizontal scale and massing albeit these are mitigated to neutral by the vertical colouration pattern which provides vertical expression. The development's presence here will be noticeable and will reduce some of the openness and expansive views currently afforded through this open space. Overall, the magnitude of visual impact is deemed to be medium, the quality of the effect is neutral.	Moderate / Neutral / Permanent

Table 11.4 Operational Phase Visual Effects

	Existing view	Sensitivity	Description and Magnitude of Visual impact	Significance
VP3	This view will be experienced by residents and visitors to the housing area. The view takes in estate grassland, a line of foreground vegetation, glimpses of roofscapes with the hills of County Clare in the background.	Medium-low	The Proposed Development will completely alter the view due to its proximity and massing. The upper parts of the proposed buildings will be prominent and visible against a background sky. The material finishes and colour scheme are not striking or distracting and are of a high quality of design and finish. The difference in various brick facade colours help to break up the massing. Articulation to the elevations helps to create variety and mitigates the horizontal bulk and massing. There will be negative effects overall due to the loss of openness, but this is balanced by the infill of this brownfield site with a high quality of development. Overall, the magnitude of visual impact is deemed to be high - the quality of the effect is marginally negative.	Moderate / Negative-Neutral / Permanent
VP4	The view will be experienced by residents and visitors to this housing area. This viewpoint is looking in the northeast direction towards the site. It is located on an internal road with a footpath from the housing area immediately west of the site. The road and footpath are visible towards the left side of the view. The right side of the photograph consists of grassland which terminates at a vegetated fenceline marking the site boundary. There are cross valley views across the Groody Valley and despite built forms and overhead lines, the character of these views is mostly green, lush and expansive. On the left side of the photograph the Travelodge building breaks the skyline and forms a local landmark.	Medium-low	The residential blocks of the Proposed Development will be clearly visible at a close distance completely obscuring the cross valley prospect. The proposed 4 storey medical facility rises to a slightly greater extent to the left of the Travelodge, which is seen in a gap between the proposed blocks. Together, the blocks provide a much greater degree of spatial containment than currently occurs. A mix of various brick colours and render façade materials creates interesting variation in the way the residential buildings appear and highlights the high quality of design and finish for the development. However, the mass of the building appears slightly bulky from this angle. It is noted that the massing steps down towards the Travelodge. The medical facility has a distinctly commercial appearance with a high degree of glass and a façade that notably varies from the residential block. This provides welcome variation and a richer mix of façade treatments that highlight the mixed use of the site. It is also likely that the residents of this housing area will experience some sense of overlooking from the proposed apartment blocks considering the difference in the building heights between the proposals and the two storey vernacular.	Moderate / Negative-Neutral / Permanent

Table 11.4 Operational Phase Visual Effects

	Existing view	Sensitivity	Description and Magnitude of Visual impact	Significance
			However, the overlooking can be considered as passive surveillance on the foreground open space rather than reducing the sense of privacy for dwellings which also front onto the open space. The buildings will appear prominently against the background sky and will completely alter the character of the cross valley views, but in the context of infilling the urban fabric void with a high quality of development. Overall, the magnitude of visual impact is deemed to be high - the quality of the effect is marginally negative.	
VP5	This is a view looking at the site in the east from the shopping centre car park which is located to the west of the site. This view will be experienced by shoppers at the shopping centre. The supermarket car park roundabout is visible in the centre-left of the view. On the right side, the ground floor of the edge of the shopping centre building is visible and is fronted by a patch of grass and a pedestrian path. Lighting columns are visible on both sides. In the midground, the trimmed hedges that mark the extent of supermarket parking are visible. In the midground beyond the roundabout there are hoardings marking the site boundary. The opposing valley flanks of the Groody River form a distant, well vegetated horizon.	Medium-low	The Proposed Development will be clearly visible from the shopping centre parking at a close distance. The most prominent feature in the foreground is the proposed medical facility building, which has a high quality of architectural design and finish. It is an appropriate transition between the shopping centre and the proposed residential block, which is partially visible just beyond the medical building on the same alignment. There will be a partial loss of openness, but in a manner that reflects the appropriate scale and mixed-use nature of the Parkway Valley masterplan lands and therefore the zoning objective. The overall effect is of a marginally positive quality due to the balance of factors outlined above and the appropriate infill of this void in the prevailing landscape fabric . Overall, the magnitude of visual impact is deemed to be Medium - the quality of effect is Neutral-Positive.	Slight-Moderate / Neutral / Permanent
VP6	This view would be experienced by road users located on the regional road R445, Dublin Road, which radiates east from central Limerick towards Castletroy. The road marks the northern boundary of part of the site, while the viewpoint itself is from approx. 350 m west of the site.	Low	Most parts of the Proposed Development are screened by roadside vegetation and built form. There will be glimpsed views of the upper parts of some of the buildings in the distance. The proposals would be barely perceptible to road users. There would be a slight increase in the density of built form in fleeting views. In	Slight / Neutral / Permanent

Table 11.4 Operational Phase Visual Effects

	Existing view	Sensitivity	Description and Magnitude of Visual impact	Significance
	The four lanes of the carriageway dominate the foreground of the view. The midground consists of road infrastructure and there is a petrol station to the left while on the right there is a shopping centre beyond a green verge. Both sides of the road have footways. The view is taken from the central point of the road and converges into a single point. Along the road, intermittent mature trees and light columns are visible.		winter months there would be a higher magnitude of change with filtered views of the northernmost extents of the massing through the trees flanking the road. Overall, the magnitude of visual impact is deemed to be low and the quality of the effect is neutral .	
VP7	This view would be experienced by users of a local road and cycleway to the north of the site. The nearest part of the site is at approx. 165 m. The short section of road, roughly 650 m long, stretches from a roundabout on the R445 past a residential estate, the Travelodge local landmark, a supermarket and other amenities and runs parallel to the strategic Dublin road. It also provides access to the housing estates located to the north and northwest of the view location. The view itself faces south towards the site. The road is visible in the foreground terminating abruptly in a retaining concrete wall with fencelines, rear gardens, grassland, weeds and a line of vegetation against the skyline beyond.	Medium-low	The site and the buildings are visible in only small glimpses due to the intervening topography and vegetation at this point. Only the upper parts of a few of the buildings will be visible, forming a coherent new townscape element on the skyline and introducing depth and a potential new landmark into an otherwise unremarkable view. This is a summer view, and it shows the presence of more foliage on the trees. In winter, there will be a little more of the development visible depending on the foliage, however the topography and distance will impact the visibility even in winter, therefore, there will be no significant difference in visual impact due to seasonality. Overall, the magnitude of visual impact is deemed to be Medium-low - the quality of effect is positive .	Moderate-slight / Positive / Permanent
VP8	This viewpoint is from a regional road R445, Dublin Road, which radiates east from central Limerick towards Castletroy and then connects to the M7. There is an access road leading to a shopping centre on the right hand side of the photograph. Road infrastructure including a set of traffic lights and lighting columns are key components in the foreground. The pedestrian path on the left side of the road is visible. The midground of the view takes in the northwest corner of the site, which is located a little further behind the trimmed hedges visible in the centre-right of the photograph. Black hoardings on the right side of the road	Low	The Proposed Development would appear against the background sky in the midground and the massing would be broken up somewhat by intervening vegetation. The proposals would introduce built form into an undeveloped part of the skyline and would represent a pleasing addition. It is assumed that the future baseline would include landmark taller, more slender buildings nearer to the view location and drawing the eye. The colouration pattern of both the residential and medical blocks provides useful vertical expression to break up the massing and provide welcome richness and variation to the mixed use facades. The development's presence here will be noticeable and will reduce	Slight / Positive-Neutral / Permanent

Table 11.4 Operational Phase Visual Effects

	Existing view	Sensitivity	Description and Magnitude of Visual impact	Significance
	mark the site boundary. There are glimpses of the vegetation within the Groody Valley on the left hand side of the photograph appearing above the site hoardings.		openness slightly, albeit overall the effect is marginally positive as the buildings provide some depth and visual interest compared to the existing vacant site. This is a summer view. In winter there will be more of the development visible depending on the foliage, albeit one can still sense its overall scale and extent. Therefore, there will only be a slight difference in visual impact due to seasonality. Overall, the magnitude of visual impact is deemed to be low and the quality of the effect is marginally positive.	
VP9	This viewpoint is from a regional road R445, Dublin Road, which marks the northern boundary of the site. The viewpoint is orientated towards S/SE directly at the site. The road is visible in the foreground with the boarded up area of site on the other side of the road. A few tops of trees are visible beyond the boards.	Low	The upper parts of the northernmost extents of the massing proposals would appear against the background sky in the midground. The proposals would introduce built form into an undeveloped part of the skyline. It is assumed that the future baseline would include landmark, taller, more slender buildings nearer to the view location and drawing the eye. In its current form the building complex will serve as a minor landmark and will help with wayfinding on this road and the articulation and symmetry breaking provides visual interest. Overall, the effect is positive as the buildings provide depth and visual interest compared to the existing vacant site and featureless horizon. Overall, the magnitude of visual impact is deemed to be low and the quality of effect is positive.	Slight / Positive / Permanent
VP10	This viewpoint is from a regional road R445, Dublin Road, which radiates east from central Limerick and goes towards Castletroy and then connects to M7. This view is taken from roughly 260 m northeast of the site boundary. This view will be experienced while entering Limerick from Castletroy and Newcastle. The view is from the point just outside the Travelodge building which is a 10 story high structure, thus a similar view will be experienced by users of Travelodge and other buildings in that building complex. The four lane road forms a major part of this view with a cycle path	Medium-low	The Proposed Development is offset to the south of the road alignment and will not be visible from this particular location due to intervening vegetation. However, the upper levels of the Proposed Development may come into view at different points along this section of road. The Proposed Development will have little effect on visual amenity from here even during winter months and is deemed to have a visual impact of Low-negligible with a quality of effect that is Neutral.	Slight-imperceptible / Neutral / Permanent

Table 11.4 Operational Phase Visual Effects

	Existing view	Sensitivity	Description and Magnitude of Visual impact	Significance
	running on the right side of the road. The road has lamp posts on both sides. There is a pedestrian path on the left side of the road. The land beyond on the left side is marked by a stone wall boundary. Further along going west, both sides of the road have mature trees.			
VP11	This viewpoint is from a roundabout about regional road R445, Dublin Road, located on the western edge of Castletroy. The view is pointing towards the site which is located in the southwest direction approx. 515 m away. On the right side of the view part of the centre of the roundabout is visible with grass and a mature tree. Further along on the road beyond the roundabout, on the right side, the tall Travelodge building is visible. Electricity pylons and lampposts add vertical elements towards the left side of the road. A road turning left (towards south) from the roundabout is just visible at the left edge of the view. The land at the corner is fenced up and some trees and vegetation are visible beyond the fence with a glimpse of a building in between.	Medium-low	The upper parts of the proposal would be a fleeting glimpse and barely noticeable component of the view for users travelling at speed. At this distance, the changes to the scene are subtle and overall the proposals offer neither an improvement nor deterioration to the existing view. This is a summer view and it shows a more lush setting. In winter there will be more of the development visible depending on the foliage, however one can still sense its overall scale and extent. Therefore, there will be no significant difference in visual impact due to seasonality. Overall, the magnitude of visual impact is deemed to be low and the quality of the effect is neutral.	Slight / Neutral / Permanent
VP12	This viewpoint is from a roundabout on Groody Road which is a local road that runs along the western edge of Castletroy along the river Groody and its meadow. River Groody is a tributary of river Shannon. The viewpoint is approx. 550 m east of the site boundary. This viewpoint will be experienced by users of this road, cyclists and pedestrians walking along the footpath as well as residents from the housing areas on the left side of the road. The road and part of the roundabout are visible in the background. The edge of the road has a cycle path and a fence beyond which the meadow is visible. There are some trees along the road and behind the meadow in the background. In the distant background, electricity pylons are visible. Towards the right side of the view, the Travelodge building located on R445 is visible behind trees and vegetation.	Medium-low	The full eastern view of the development will be visible across the meadow from this viewpoint and the viewer will be able to see the extent of various building blocks. The sense of openness that the view across the meadow provides currently will be affected but overall the impact will not be significant. The composition of the built form creates a progression of scale with taller elements towards the centre of the massing. The visual effect is pleasing and the proposals offer a slight improvement to the existing view. This is a summer view and it shows a more lush setting. In winter there will be more of the development visible depending on the foliage, however one can still sense its overall scale and extent. Therefore, there will be no significant difference in visual impact due to seasonality.	Slight / Positive / Permanent

Table 11.4 Operational Phase Visual Effects

	Existing view	Sensitivity	Description and Magnitude of Visual impact	Significance
			Overall, the magnitude of visual impact is deemed to be low - the quality of effect is positive .	
VP13	This viewpoint is from a roundabout on Groody Road further south from VP12. The viewpoint is approx. 870 m southeast of the site boundary. This viewpoint will be experienced by users of this road, cyclists and pedestrians walking along the footpath as well as residents from the housing areas on the left side of the road. The central part of the roundabout is visible on the right side of the viewpoint with grass and a tree in the middle. Low hedges and vegetation are visible on the edges of the roundabout. Through a gap in the vegetation, the meadow is visible with some cattle grazing. Trees are visible in the background. Towards the right side in the distant background, the Travelodge building is visible.	Medium-low	The upper parts of the proposals would be a noticeable component of the view due in part to their contrasting appearance compared to the well vegetated intervening landscape. The black coloured elements at the tops of the buildings strike a discordant tone. At this distance, the changes to the scene are subtle and overall the proposals offer neither an improvement nor deterioration to the existing view. This is a summer view and it shows a more lush setting. In winter there will be more of the development visible depending on the foliage, however one can still sense its overall scale and extent. Therefore, there will be no significant difference in visual impact due to seasonality. Overall, the magnitude of visual impact is deemed to be low and the quality of the effect is neutral.	Slight / Neutral / Permanent
VP14	This view is from a local road in a housing area in Kilbane and is located roughly 1.15 kms southeast of the site boundary. In the foreground the road is visible. The left side of the road has a wooden fenced edge with a mixture of vegetation beyond that includes hedges and mature trees. The vegetation is in various layers and does not afford the view of the meadow which lies in front. In the very distance, a hill is visible.	Medium-low	The development site is not visible due to the presence of layers of intervening vegetation. Overall, the magnitude of visual impact is deemed to be negligible . This is a summer view and it shows a more lush setting. In winter there might be very small glimpses of the development visible from a far distance. However, there will be no significant difference in visual impact due to seasonality.	Imperceptible / Neutral / Permanent
VP15	This view is from Tipperary roundabout on a regional road R509. The site boundary is at a distance of approx. 1 km in the northeast direction. The area around is primarily industrial, thus the viewpoint will be mainly experienced by the road users. The view is dominated by the roundabout in the centre. Several cars are present on the roundabout. Towards the right and left side various industrial warehouse buildings are visible. The left side of the view is dotted with mature trees that are along the road and the roundabout.	Medium-low	The development site is not visible due to the distance and its location which is behind several layers of buildings. Overall, the magnitude of visual impact is deemed to be negligible .	Imperceptible / Neutral / Permanent

Table 11.4 Operational Phase Visual Effects

	Existing view	Sensitivity	Description and Magnitude of Visual impact	Significance
VP16	This southerly view is from a pedestrian path along river Shannon on the north side of the site. The site boundary is located approx. 900m south of this viewpoint. In the foreground, grassland and a tree are visible, the midground consists of a wide expanse of floodplain grassland. The view stretches south with a part vegetated and part built horizon line in the background and outline of buildings of Limerick in the distant background. Towards the centre of the photography, the Travelodge building punctuates the skyline.	Medium	A glimpse of the uppermost parts of several residential blocks is afforded through and just above intervening vegetation and buildings. The Proposed Development lies just to the right of the considerably more prominent Travel Lodge Hotel building and associated business park units in is much less conspicuous due the relative scale / distance. This is a summer view and in winter, there might be a little more visibility of the built complex, but overall, there will be no significant difference in visual impact as the distance is large and the extent of view is limited. Overall, the magnitude of visual impact is deemed to be low and the quality of the effect is neutral.	Slight / Neutral / Permanent

11.6 Mitigation Measures

11.6.1 Construction Phase

It is not considered that there are any additional mitigation measures required to reduce the anticipated construction phase townscape/visual effects over those that would be considered standard best practice construction management measures. It is anticipated that this may include aspects such as the timing of construction activities, which will be restricted per local authority guidance, and will likely be consistent with those enforced on nearby sites. A site hoarding will also screen ground level clutter and activity from view.

11.6.2 Operational Phase

Landscape and urban design measures are integral to the development and will help to soften and assimilate the built form within its surrounding context in a general sense whilst adding to the quality of the development. However, it is not a case where the consideration of landscape and visual impacts before and after landscape planting establishment would result in a materially different impact judgements.

Other than those features and characteristics of the development proposals that have been embedded into the design of the scheme, there are no specific townscape and visual mitigation measures considered necessary in this instance.

11.7 Monitoring or Reinstatement Measures

11.7.1 Construction Phase

Landscape tender drawings and specifications will be produced to ensure that the hard and soft works are implemented in accordance with best practice. This document will include tree work procedures, soil handling, planting and maintenance. The contract works will be supervised by a suitably qualified landscape architect.

The planting works will be undertaken in the next available planting season after completion of the main civil engineering and building work.

All tree protection requirements will be installed on commencement of the development and removed on a phased basis as stages of the development are completed.

11.7.2 Operational Phase

This will consist of weed control, replacement planting, pruning etc. All townscape works will be in an establishment phase for the initial three years from planting. All works will be monitored on an ongoing basis to ensure the quality of the development is maintained.

11.8 Residual Effects of the Proposed Development

All the townscape and visual mitigations are primary/embedded hence this section is not relevant to this topic. The effects assessed in section 11.5 can be considered the residual townscape and visual effects of the project.

11.9 Cumulative Impacts of the Proposed Development

Within a cumulative assessment, the baseline against which landscape and visual effects are assessed is extended to consider other relevant schemes that are not currently present but that are subject to a valid planning application, have been permitted, or are part of a current masterplanned zoning objective, as being operational. Cumulative effects therefore represent any increased effects that may be generated by the development in a scenario where other relevant schemes in the locality are operational.

As is typical of any evolving urban environment, it is acknowledged that there are numerous development projects planned and permitted within the wider urban area. In this case, the most relevant would be the realisation of the full Parkway Valley masterplan in accordance with Development Plan zoning objectives. This relates to intensive and large scale mixed-use development between the subject site and the R445 entrance into Limerick City from the east.



To aid the cumulative assessment, the likely form of the future phases of the Parkway Valley masterplan have been included as 'mass model' cumulative views within the photomontage volume. These are assessed in Table 11.5 below.

Table 11.5 Magnitude of Change - Visual

Viewpoint	Cumulative effect in combination with later phases of Parkway Valley Masterplan
VP1	The future cumulative development of the Parkway Valley masterplan will be seen to fill the gap between the Proposed Development and the foreground Lidl supermarket. There will be a marginal increase in the intensity and extent of cumulative development that will give this setting a slightly more urban rather than peri-urban character. The cumulative effect will accord with the masterplan zoning objective for the Parkway Valley site and is therefore not considered to be significant or adverse.
VP2	The future cumulative development of the Parkway Valley masterplan will be seen to the right of the Proposed Development but is partially screened by it. There will be a noticeable increase in the height, intensity and extent of cumulative development that will give this setting a slightly more urban and enclosed character. The cumulative effect will accord with the masterplan zoning objective for the Parkway Valley site and is therefore not considered to be significant or adverse. Indeed, it consolidates the Proposed Development on an infill site.
VP3	The future cumulative development of the Parkway Valley masterplan will not be visible from here due to screening by the Proposed Development. Consequently, there will be no material cumulative effects arising from it.
VP4	The future cumulative development of the Parkway Valley masterplan will be seen between the medical and residential blocks and is partially screened by them. There will be a noticeable increase in the height, intensity and extent of cumulative development that will give this setting a slightly more urban and enclosed character. The cumulative effect will accord with the masterplan zoning objective for the Parkway Valley site and is therefore not considered to be significant or adverse. Indeed, it consolidates the Proposed Development on an infill site and provides a greater sense of site utility.

Viewpoint	Cumulative effect in combination with later phases of Parkway Valley Masterplan
VP5	The future cumulative development of the Parkway Valley masterplan will be seen to the left of the Proposed Development forming a coherent street between them that will be accessed from the foreground roundabout. There will be a substantial increase in the height, intensity and extent of cumulative development that will give this setting a much more urban and enclosed character rather than an underutilised peri-urban one. The cumulative effect will accord with the masterplan zoning objective for the Parkway Valley site and is therefore not considered to be significant or adverse. Indeed, it consolidates the Proposed Development on this infill site that currently reads as a void in the urban fabric where consolidated street frontage to the R445 eastern approach to Limerick is a latent need.
VP6	The future cumulative development of the Parkway Valley masterplan will be seen on direct alignment with the road where it will form a prominent and welcome landmark feature on the eastern approach to Limerick City. It will be much more noticeable than the Proposed Development and there will be a distinct increase in the height, intensity and extent of cumulative development that will give this setting a much more urban and enclosed character. The cumulative effect will accord with the masterplan zoning objective for the Parkway Valley site and is therefore not considered to be significant or adverse.
VP7	The future cumulative development of the Parkway Valley masterplan will rise much more noticeably above intervening vegetation and buildings than the Proposed Development. It will be a distinct increase in the height, intensity and extent of cumulative development that will give this setting a much more urban and enclosed character. The cumulative effect will accord with the masterplan zoning objective for the Parkway Valley site and is therefore not considered to be significant or adverse.
VP8	The future cumulative development of the Parkway Valley masterplan will rise prominently in the foreground forming a welcome landmark feature on the eastern approach to Limerick City. It will screen the residential blocks of the Proposed Development and be much more noticeable as a result. There will be a distinct increase in the height, intensity and extent of cumulative development that will give this setting a much more urban and enclosed character. The cumulative effect will accord with the masterplan zoning objective for the Parkway Valley site and is therefore not considered to be significant or adverse. Indeed, it consolidates the Proposed Development on this infill site that currently reads as a void in the urban fabric where consolidated street frontage to the R445 eastern approach to Limerick is a latent need.
VP9	The future cumulative development of the Parkway Valley masterplan will rise prominently in the foreground forming a welcome landmark feature on the eastern approach to Limerick City. It will screen most of the Proposed Development beyond. There will be a distinct increase in the height, intensity and extent of cumulative development that will give this setting a much more urban and enclosed character. The cumulative effect will accord with the masterplan zoning objective for the Parkway Valley site and is therefore not considered to be significant or adverse. Indeed, it consolidates the Proposed Development on this infill site that currently reads as a void in the urban fabric where consolidated street frontage to the R445 eastern approach to Limerick is a latent need.
VP10	The future cumulative development of the Parkway Valley masterplan will rise prominently in the midground forming a prominent and welcome landmark feature on the eastern approach to Limerick City. However, the Proposed Development will remain substantially screened from view and does not materially contribute to cumulative effects experienced from here.

Viewpoint	Cumulative effect in combination with later phases of Parkway Valley Masterplan
VP11	The future cumulative development of the Parkway Valley masterplan will rise noticeably in the midground and will be more noticeable than the Proposed Development. The cumulative effect will accord with the masterplan zoning objective for the Parkway Valley site and is therefore not considered to be significant or adverse. Indeed, it consolidates the Proposed Development on this strategic infill site on approach to Limerick City.
VP12	The future cumulative development of the Parkway Valley masterplan will be seen just to the fore and to the right of the Proposed Development but is only partially visible due to foreground screening. There will be a marginal increase in the intensity and extent of cumulative development that will consolidate the urban edge character. The cumulative effect will accord with the masterplan zoning objective for the Parkway Valley site and is therefore not considered to be significant or adverse.
VP13	The future cumulative development of the Parkway Valley masterplan will be seen just to the right of the Proposed Development but is only partially visible due to foreground screening. There will be a noticeable increase in the height, intensity and extent of cumulative development that will consolidate the urban edge character. The cumulative effect will accord with the masterplan zoning objective for the Parkway Valley site and is therefore not considered to be significant or adverse.
VP14	Neither the proposed or future cumulative development of the Parkway Valley masterplan will be particularly noticeable in this view, thereby limiting the potential for material cumulative effects to occur.
VP15	Neither the proposed or future cumulative development of the Parkway Valley masterplan will be particularly noticeable in this view, thereby limiting the potential for material cumulative effects to occur.
VP16	The future cumulative development of the Parkway Valley masterplan will rise more noticeably above intervening vegetation and buildings than the Proposed Development and will further screen the Proposed Development, thereby limiting the potential for material cumulative effects to occur.

Based on the assessment contained in Table 11.5 The future cumulative development of the Parkway Valley masterplan will not generate any significant or adverse cumulative effects because in conjunction with the Proposed Development it represents the full realisation of the strategic masterplan for the Parkway Valley site. This is a masterplan that seeks a high quality of urban design to fit the requirement for a consolidating eastern landmark development for Limerick City.

In addition to the future cumulative development of the Parkway Valley masterplan another large scale residential development is also relevant to cumulative impacts in this area and this is: Groody Developments Ltd, Groody Road. This is located on the opposing side of the Groody valley, some 250m from the site at its closest point. It consists of student accommodation across 5 no. separate blocks, ranging in height from 5 - 8 storeys. Upon review of the zoning plan this scheme appears to be allocated for residential development. The masterplan for the site shows wetland areas to the west to assist in the achievement of planning policies related to the Groody Valley Green Wedge which lies between this and the Parkway Valley site. The blocks would not compete in height compared to future landmark and gateway defining features near the site. For these reasons this development is considered to have similar positive placemaking characteristics to the Proposed Development. It is assumed that the architectural detailing and other elements of the masterplan are of sufficient standard of design to gain a planning consent and

provide positive townscape and visual effects. For these reasons significant or adverse cumulative effects are not considered to occur in relation to the potential future Groody Developments project.

RECEIVED: 28/05/2026

11.10 References

- ▶ Department of Housing, Planning & Local Government (DHPLG) (2018) Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment
- ▶ Environmental Protection Agency (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports
- ▶ Landscape Institute and the Institute of Environmental Management and Assessment (IEMA) publication entitled Guidelines for Landscape and Visual Impact Assessment, 2013 (GLVIA3); and
- ▶ 'Photography and Photomontage in Landscape and Visual Impact Assessment', Landscape Institute Technical Guidance Note 06/2019.



RECEIVED: 28/05/2026

Chapter 12 – Archaeological, Architectural and Cultural Heritage

TABLE OF CONTENTS

12. ARCHAEOLOGICAL, ARCHITECTURAL AND CULTURAL HERITAGE	12-1
12.1 Introduction.....	12-1
12.2 Methodology	12-1
12.2.1 Forecasting Methods and Difficulties Encountered	12-1
12.2.2 Sites and Monuments Record (SMR) and Record of Monuments and Places (RMP).....	12-2
12.2.3 National Monuments.....	12-2
12.2.4 Excavations Database.....	12-3
12.2.5 The Topographical Files of the National Museum of Ireland.....	12-3
12.2.6 Protected Structures and National Inventory of Architectural Heritage Sites	12-3
12.2.7 Limerick Development Plan 2022-2028.....	12-4
12.2.8 Cartographic Sources and Aerial Imagery	12-4
12.2.9 Archaeological Reports	12-4
12.2.10 Documentary research.....	12-4
12.2.11 Standards and Guidelines.....	12-5
12.2.12 Significance Criteria	12-5
12.3 Receiving Environment	12-5
12.3.1 Historical and Archaeological Background	12-6
12.3.2 Recorded Archaeological Monuments (RMP/SMR Sites)	12-7
12.3.3 National Monuments.....	12-7
12.3.4 Previously Unrecorded Sites	12-8
12.3.5 Previous Archaeological Investigations	12-8
12.3.6 Record of Protected Structures (RPS).....	12-8
12.3.7 National Inventory of Architectural Heritage (NIAH).....	12-9
12.3.8 Cartographic Sources and Aerial Imagery	12-9
12.3.9 Topographical Files	12-13
12.3.10 Field Inspection.....	12-13
12.4 Characteristics of the Proposed Development.....	12-15
12.5 Potential Impacts of the Proposed Development	12-15
12.5.1 Construction Phase	12-15
12.5.2 Operational Phase.....	12-15
12.6 Mitigation Measures.....	12-16
12.6.1 Archaeological Heritage	12-16
12.6.2 Architectural and Cultural Heritage.....	12-16
12.7 Residual Effects of the Proposed Development.....	12-17
12.8 Cumulative Effects of the Proposed Development.....	12-17
12.9 Summary of Significant Effects	12-17
12.10 Monitoring or Reinstatement Measures.....	12-18
12.11 References.....	12-19

LIST OF TABLES

Table 12-1. Residual Effects of the Proposed Development Table

12-17

RECEIVED: 28/05/2026

LIST OF FIGURES

Figure 12-1. Location of Proposed Development (Landsat 2025)	12-2
Figure 12-2 Location of area proposed for archaeological monitoring at construction stage in blue (Landsat 2025).	12-16

12. ARCHAEOLOGICAL, ARCHITECTURAL AND CULTURAL HERITAGE

12.1 Introduction

This chapter presents the findings of an archaeological and cultural heritage impact assessment on the site of the Proposed Development. A full project description is presented in Chapter 2 of this EIA.

The Site has previously been stripped of topsoil, and a development partially constructed on the site in 2007, under a separate grant of planning. No archaeological measures were requested under that grant of planning.

There are no archaeological monuments, as listed in the Record of Monuments and Places (RMP) and the Sites and Monuments Record (SMR), within the site. The closest Recorded Monument is approximately 40m from the site boundary. It is the site of a small archaeological excavation of a pit (LI005-107----).

A satellite image of the Site is presented in Figure 12-1.

12.2 Methodology

For the purposes of this report, archaeology, architectural and cultural heritage are considered to include the following elements:

- ▶ Sites and Monuments Record (SMR)
- ▶ Record of Monuments and Places (RMP)
- ▶ National Monuments
- ▶ Sites reported in the Database of Irish Excavation Reports
- ▶ Any previously unrecorded sites
- ▶ A list of architectural heritage structures (NIAH)
- ▶ A list of Protected Structures (Limerick City and County Development Plan 2022–2028)
- ▶ Other documentary sources (townland and placename evidence and Griffith's Valuation)

12.2.1 Forecasting Methods and Difficulties Encountered

No difficulties were encountered.

Figure 12-1. Location of Proposed Development (Landsat 2025)



12.2.2 Sites and Monuments Record (SMR) and Record of Monuments and Places (RMP)

The Record of Monuments and Places (RMP) was established under Section 12 of the 1994 National Monuments (Amendment) Act. A Sites and Monuments Record (SMR) was issued for all counties in the State between 1984 and 1992. The SMR is a manual containing a numbered list of certain and possible monuments accompanied by 6-inch Ordnance Survey maps (at a reduced scale). The SMR formed the basis for the legally defined Record of Monuments and Places (RMP) - the statutory list of recorded monuments established under Section 12 of the National Monuments (Amendment) Act 1994.

12.2.3 National Monuments

The National Monuments Service website lists Monuments covered by Preservation Orders and in the ownership/guardianship of the Minister for Housing, Local Government and Heritage by county

(<https://www.archaeology.ie/about-us/what-we-do/monuments-in-state-care/national-monuments-in-state-care/>).

The term 'National Monument' is defined by the National Monuments Act (1930) as being 'a monument or the remains of a monument the preservation of which is a matter of national importance by reason of the historical, architectural, traditional, artistic, or archaeological interest attaching thereto'.

The Historic and Archaeological Heritage and Miscellaneous Provisions Act 2023 is a major piece of Irish legislation aimed at modernizing and strengthening the protection of archaeological and historical heritage in Ireland. It was enacted in October 2023, after passing both Houses of the Oireachtas and being signed into law. It replaces and consolidates older laws, especially the National Monuments Acts 1930–2014. It creates a single, modern legal framework for protecting monuments, archaeological sites, and objects. Under this Act, newly discovered archaeological monuments are immediately protected by law, without needing formal designation.

12.2.4 Excavations Database

This is an online database of archaeological excavation reports from across Ireland (both the Republic and Northern Ireland). It's based on the Excavations Bulletin. It is available at www.excavations.ie.

12.2.5 The Topographical Files of the National Museum of Ireland

All archaeological objects which are found, and which have no known owner at the time when they are found, are the property of the State. The National Museum of Ireland (NMI) acts as the primary national repository for archaeological objects, tasked with the acquisition, preservation, research, and exhibition of Ireland's cultural heritage. The National Museum of Ireland (NMI) maintains topographical files that record stray archaeological finds and other discoveries, organized by townland and county. These files are part of the museum's broader archive collection and are crucial for understanding the archaeological significance of different areas in Ireland.

12.2.6 Protected Structures and National Inventory of Architectural Heritage Sites

A protected structure is a structure that a local authority considers to be of special interest from an architectural, historical, archaeological, artistic, cultural, scientific, social or technical point of view. Details of protected structures are entered by the local authority in its Record of Protected Structures. These are protected under Part IV of the Planning and Development Act 2000, as amended and listed in Volume 3: Architectural Conservation Areas and Record of Protected Structures in the Limerick Development Plan 2022–2028.

The National Inventory of Architectural Heritage (NIAH) is an Irish government initiative that identifies and records structures of significance built from 1700 to the present. It provides recommendations to local authorities for protecting built heritage, with over 65,000 records available online for viewing, including a Historic Environment Viewer. It was established on a statutory basis under the provisions of the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act 1999. The list forms the basis for the recommendations for inclusion in the Record of Protected Structures (RPS).

12.2.7 Limerick Development Plan 2022-2028

The Limerick Development Plan 2022-2028 was adopted by the Elected Members of Limerick City and County Council at a Special Meeting on 17th June 2022 and came into effect on 29th July 2022.

12.2.8 Cartographic Sources and Aerial Imagery

Several cartographic sources were consulted as part of this assessment, namely Down Survey Map of County Limerick, 1656; Down Survey map of Parish of Limerick South Liberties, Jean de Dodt map of the Siege of Limerick 1691 (Royal collection Trust). The First edition Ordnance survey map (surveyed 1840-41 – printed 1844) and revised edition (revised 1900, published 1903) Ordnance Survey 25-inch map published 1900. Aerial photographs dating between 1995 and 2018 from the Ordnance Survey of Ireland (OSi), available on www.archaeology.ie were also examined, as was Google Earth imagery dating between 2008 and 2025.

12.2.9 Archaeological Reports

The following reports were also consulted in order to inform the assessment of all aspects of the archaeological resource within the Proposed Development site.

12.2.9.1 Archaeological Impact Assessment

An archaeological impact assessment is a desktop-based report on the findings of a study of available archaeological, historical, cartographic and photographic sources, as well as a site visit. It aims to identify and describe the known and potential archaeological and cultural heritage constraints within the site and its wider environs and offer recommendations for mitigation measures. It includes the results of any archaeological investigations carried out within or adjacent to the site.

Only one report has been carried out to date within the subject site:

- Archaeological Impact Assessment Report for a Proposed Development at Parkway Valley LRD, Singland Townland, Limerick (Coyne 2025).

12.2.8.1 Site Inspection

A site inspection was carried out to examine the subject site in the light of desk-based research. The site inspection identifies the nature and extent of any surviving above-ground archaeological or cultural heritage remains (if any), and in predicting the potential effects of a proposal on potential below-ground remains. A site inspection was conducted by Frank Coyne of Aegis Archaeology Ltd. on 28 April 2026. The site is overgrown and contains the foundations and walls of the previous incomplete development, spoil heaps and overgrowth. No archaeological features were noted.

12.2.10 Documentary research

Additional desktop research included the following resources:

12.2.10.1 Townland and Placename Databases

The Irish Townlands Database (<https://www.townlands.ie/>), the Irish Placename Database (<https://www.logainm.ie/en/>) were consulted. The database provides information on over 60,000 townlands. The Placenames Database of Ireland website (www.logainm.ie) was consulted. The

Placenames Database of Ireland was created by the Gaois research group in Fiontar & Scoil na Gaeilge (DCU) in collaboration with The Placenames Branch (Department of Culture, Heritage and the Gaeltacht). It is a comprehensive management system for data, archival records and placenames research conducted by the State. Duchas.ie was also consulted for any relevant folklore relating to the site.

12.2.10.2 Griffith's Valuation (1847–1864)

Griffith's Valuation as a nationwide survey of property carried out between 1847 and 1864. The valuations were published in a series of over 300 volumes, detailing the names of all the property occupiers in Ireland and the value of their house and land. It is available at www.askaboutireland.ie.

12.2.11 Standards and Guidelines

This chapter has been prepared in compliance with all relevant EIAR legislation and guidance, including 'Guidelines on the information to be contained in Environmental Impact Assessment Reports', published by the Environmental Protection Agency (2022).

12.2.12 Significance Criteria

The impact assessment undertaken in this chapter is based on the Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA guidelines 2022) and detailed in Chapter 1 (Introduction) of this EIAR. A potentially significant impact in terms of archaeology and cultural heritage is described as an impact to a potential feature/area of archaeological or cultural heritage that could be significant without mitigation measures being implemented, e.g. potential sub-surface archaeological remains.

The main purpose of this chapter is to identify, describe and present an assessment of the likely significant effects of the Proposed Development on archaeological and cultural heritage remains (known and unknown if present). An effect can be positive, negative, or neutral/none, direct or indirect. The effect may result from the construction phase and/or the operation phase of the project.

The potential effects are assessed for each component of the development as described above, as well as cumulatively.

12.3 Receiving Environment

The development site is located within the townland of Singland in Limerick City. It measures 6.18 hectares in extent and consists a brownfield site. The site has previously been stripped of topsoil, and a development partially constructed on the site, under a separate grant of planning. No archaeological mitigation measures were requested under that grant of planning. The partially constructed development was demolished in 2020, with the retaining walls left in situ. It is understood that much of the material from the demolition was used for backfilling and land raising purposes on the site such that the site is now predominately covered in made ground. The site can be accessed from the north via the old Dublin Road (R445). The partially constructed development was located on the western and central portions of the site. Analysis of aerial photographs (see figures 12-4 and 12-11) show that topsoil was stripped from almost the entire site, but no construction occurred on the eastern and northeastern side. Therefore, while topsoil has been stripped at the eastern and northeastern side, it still has the potential to contain small archaeological features.

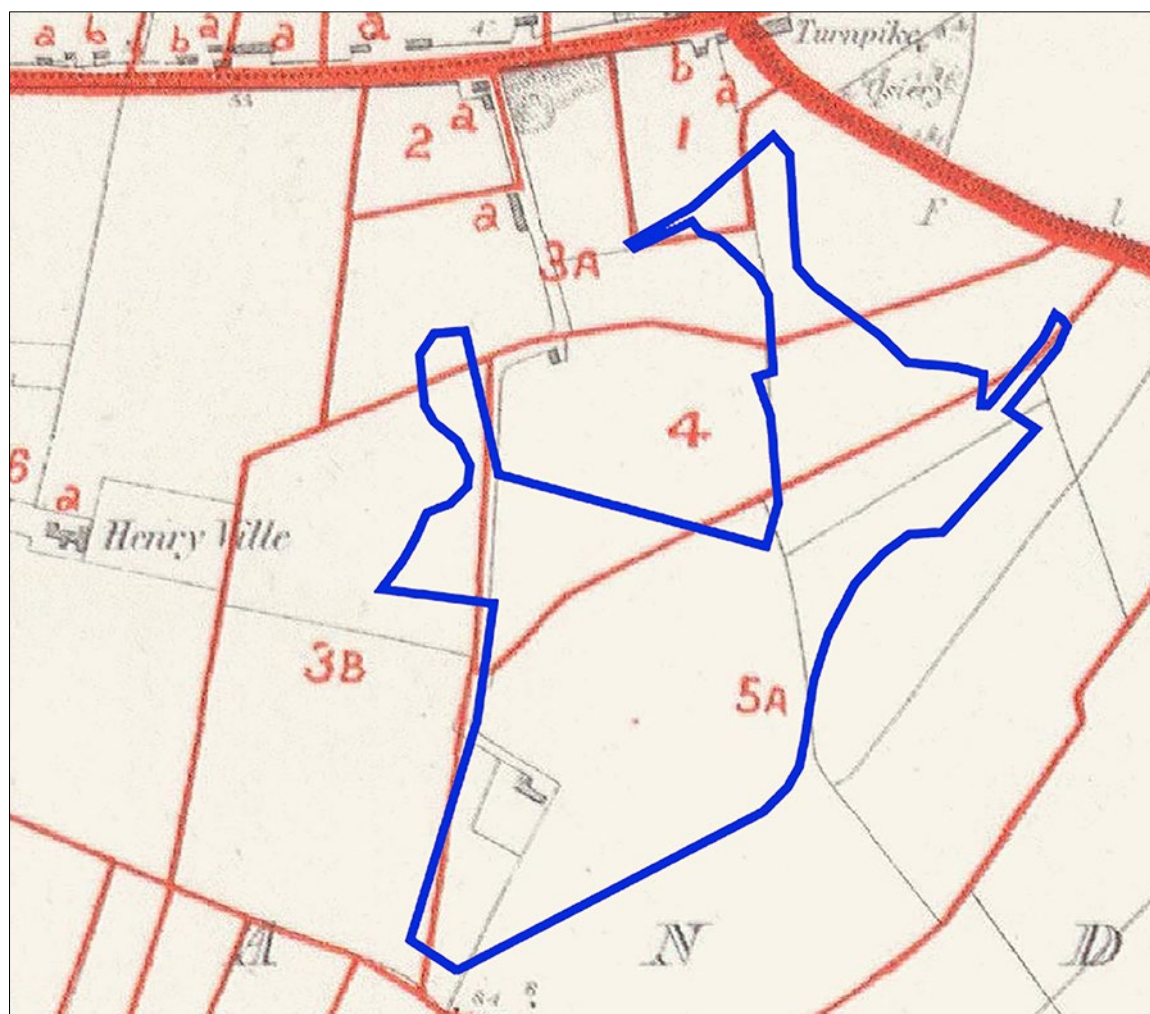
Cultural Heritage is considered here to include all recorded monuments listed in the Record of Monuments and Places (RMP) and in the Sites and Monuments Record (SMR), National Monuments (i.e. those in the ownership/guardianship of the state), Protected Structures, National Inventory of Architectural Heritage

(NIAH) sites, previously unrecorded sites, sites reported in the Excavations Database if not included in the RMP/SMR, and stray listed in the Topographical Files of the National Museum of Ireland.

12.3.1 Historical and Archaeological Background

The Site is located in the townland of Singland, the barony of Clanwilliam, and the civil parish of Saint Patrick's. in the County of Limerick The name Singland is translated from the Irish word *Shaingil*. On the The Down Survey map (1656–58) and associated terrier it is listed as consisting of 9 profitable acres. The owner of the townland in 1641 is listed as Dr. Thomas Arthur (Protestant) with the same occupier listed in 1670. Griffith's Valuation database, archives and associated map were examined (<https://www.askaboutireland.ie/griffith-valuation/index.xml?action=placeSearch>). The lands at Singland were rented by several different people at the time of the survey. These are 1a, rented by James Redding, owned by John Joseph Henry. Plots 3 a and 3b were rented by John Joseph Henry from the owners, the Vicars Choral of the Cathedral of Limerick. Plot 4 was rented by James McNamara, roger Ryan and Eleanor McNamara from the owner john Jospheh Henry. Plot 5 was rented by Patrick Coughlan from the owner, John Jospheh Henry.

Figure 12-2 Griffith's Valuation map



There are no Recorded Monuments listed in the Record of Monuments and Places (RMP) for County Limerick within the subject site.

12.3.2 Recorded Archaeological Monuments (RMP/SMR Sites)

The Site does not contain any monuments as listed in the Record of Monuments and Places (RMP) or the Sites and Monuments Record (SMR). The nearest such site is a pit /excavation (LI005-107---) situated c. 40m from the boundary of the Proposed Development site. This site was identified during monitoring of topsoil stripping associated with roadworks in 2001, and was fully excavated at that time under excavation licence no. 01E0946, (see section 12.3.5.1.).

Figure 12-3 Closest Recorded Monument (RMP).



12.3.3 National Monuments

There are no National Monuments located within the Site. The closest national Monuments are situated in Limerick City (King John's Castle LI005-017014-, National Monument in State Guardianship No. 288; Fanning's Castle LI005-017004-, National Monument in State Ownership No. 383), approximately 2.5 kilometers to the northwest of the subject site.

12.3.4 Previously Unrecorded Sites

No previously unrecorded archaeological features were noted on the subject Site.

12.3.5 Previous Archaeological Investigations

There have been no previous archaeological investigations on the subject Site.

12.3.5.1 Archaeological excavations in the environs of the site

A number of small pits were noted during monitoring of the realignment of the N7 from the Parkway roundabout to Plassey Park Road on the eastern outskirts of Limerick City. Following monitoring and initial investigation by Celie O Rahilly (Excavations 2001, No. 801), the writer was contracted to undertake an excavation of several of the features. Two of the pits were located near the centre of the road. The first was oval in plan and measured 0.69m north–south by 0.4m by 0.22m in depth. There were no finds in the charcoal-rich fill and the base was heat-reddened, indicating an in situ burning activity. This pit was disturbed by a later circular pit, which measured 0.44m in diameter and 0.22m in depth. The fill of this pit contained occasional flecks of charcoal and a small sherd of prehistoric pottery, tentatively identified as dating from the Neolithic period. Another pit was uncovered 5m to the north-west. This measured 0.98m east–west by 0.7m by 0.25m in depth. The eastern side had been oxidised and the fill contained frequent amounts of charcoal, which indicated that this pit was also used in a burning activity. A small burnt spread 10m to the north-east was found to be modern in date. The function of these pits was unclear. The burning may suggest a domestic cooking activity but there was no habitation evidence in the stripped areas surrounding the pits. They may also have had some ritual function, such as burial or votive offerings. However, there were no traces of cremated bone in any of the pits and only one contained a possible sherd of pottery. The interpretation of this site was hampered by the fact that it had been extensively disturbed in recent centuries by a field boundary bank and ditch, tree root activity and cultivation furrows

12.3.6 Record of Protected Structures (RPS)

There are no Protected Structures, as recorded in the *Limerick Development Plan 2022–2028*, within the site boundary. The closest Protected Structures are in excess of 400m from the subject site (see figure 12-4).

- ▶ RPS 1629, Blood Mill, 450m from subject site.
- ▶ RPS 1630, Singland Mill, 502m from subject site.
- ▶ RPS 1631, Singland House, 425m from subject site.

Figure 12-4 Closest Protected Structures (RPS).



12.3.7 National Inventory of Architectural Heritage (NIAH)

There are no sites listed in the National Inventory of Architectural Heritage (NIAH) within the Site boundary. The closest structure listed on the NIAH (21820001) is 780m to the northeast. This is Dromore House gate lodge.

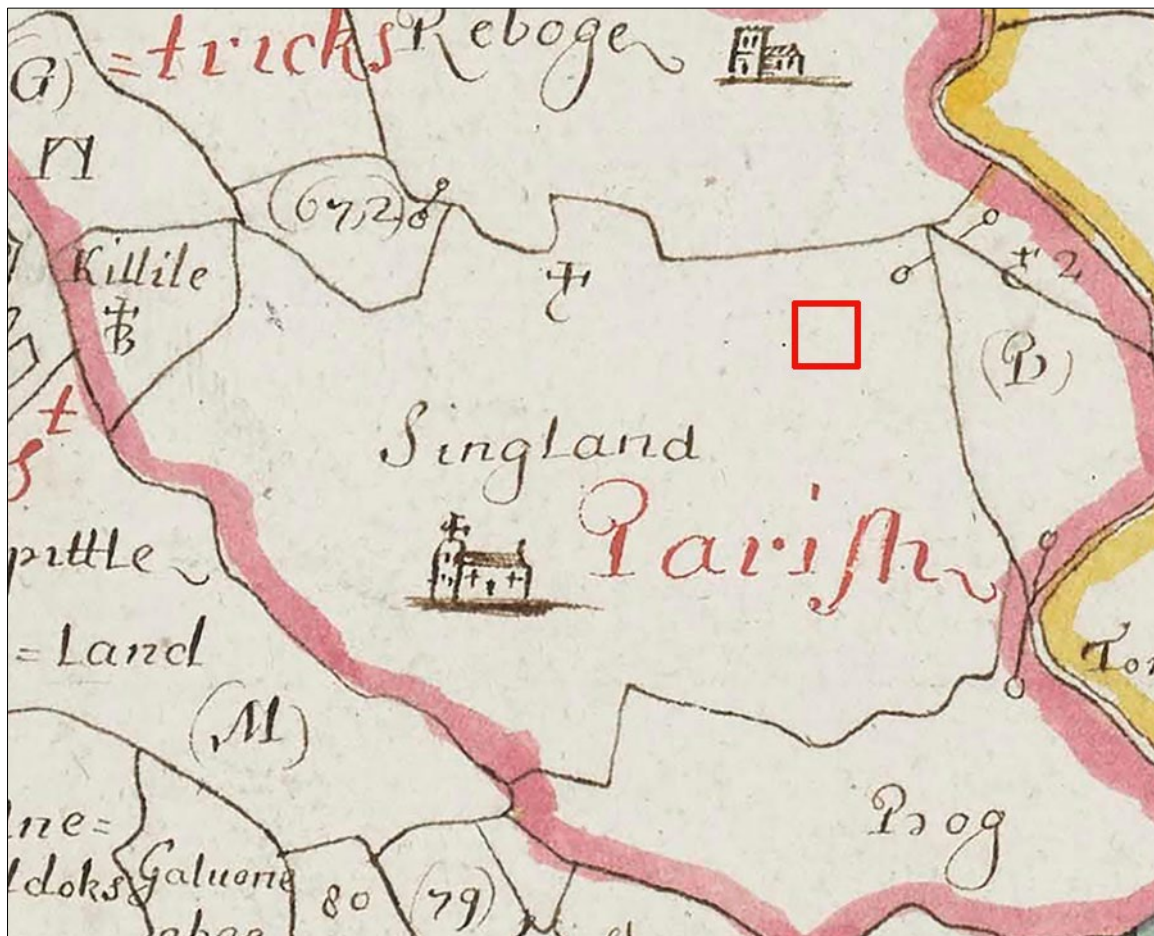
12.3.8 Cartographic Sources and Aerial Imagery

A review of available historical mapping for the area was carried out to include the Down Survey of Ireland AD 1656–58 (5), the Jean de Bodt map of the Siege of Limerick 1691 (6) and the Ordnance Survey (OS) of Ireland 6-inch (1841-2) (7) and 25-inch (190) (8) maps.

The Down Survey was a national land survey, managed by Sir William Petty then surgeon-general of the English army. Its purpose was to measure the land that was to be forfeited by Irish Catholics, so that it could be redistributed by the Crown as payment to adventurers and soldiers of the Protestant faith for

services rendered. The survey was undertaken in 1656-1658. The Down Survey generated an all-island map, and more detailed maps on a county, barony, and civil parish basis. The Down Survey map shows the townland of Singland, at that time depicted as part of the South Liberties of Limerick. It is listed as consisting of 9 profitable acres. The owner of the townland in 1641 is Thomas Arthur (Protestant) with the same occupier listed in 1670. There is no detail of the subject site on the map of the South Liberties. The only detail marked is a church, most likely St Patrick's Church (LI005-029001-). This site is located approximately 900m to the southwest, and is no longer extant.

Figure 12-5 Extract from Down Survey map of Limerick South Liberties. Approximate location of subject site indicated by red box.



The next map which shows any detail of the general area of the subject site is the Siege of Limerick map, c. 1691. The author of this map, Jean de Bodt, was born in Paris. Training as an architect, he joined the party of William of Orange, and saw service in Ireland during 1690-91. He was probably attached to General Ginkel's forces when he made this map, which is possibly the earliest large-scale survey for this area. Attention has been paid, in particular, to representing the relative levels of the terrain. The general area of Singland is indicated by the red box (annotated by writer), showing that the Williamite forces occupied a large area of the high ground in the general area of the subject site in 1691 (<https://militarymaps.rct.uk/other-17th-century-conflicts/map-of-the-siege-of-limerick-1691-limerick-munster-ireland-52deg3953n-08deg3723w-0>).

Figure 12-6 Jean de Bodt map of the Siege of Limerick 1691



The first edition OS six-inch map (Fig. 12.7), surveyed 1840-41, published 1844 shows the site as series of fields, with a lane leading to a house along the western side of the site, and a small structure at the north.

The later 25 inch map (Fig. 12.8), dated c. 1900 shows a slightly altered layout from the first edition map. The structures are now gone and the site is a series of fields. A series of drains are depicted at the eastern side of the site, attesting to the marshy nature of the ground.

Figure 12-7 Extract from 1st edition Ordnance Survey (OS) 6-inch map (surveyed 1840-41, published 1844), showing location of site

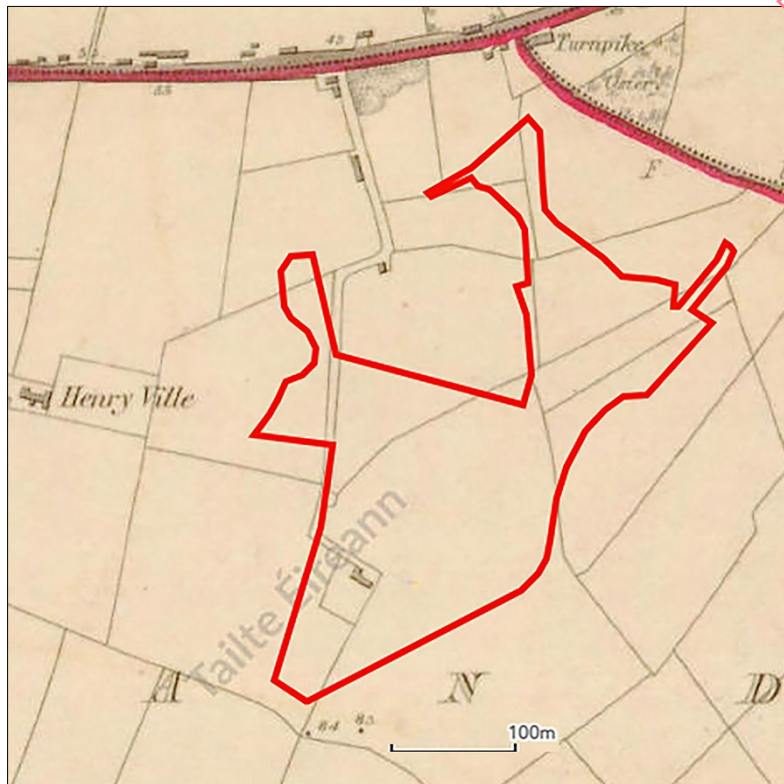
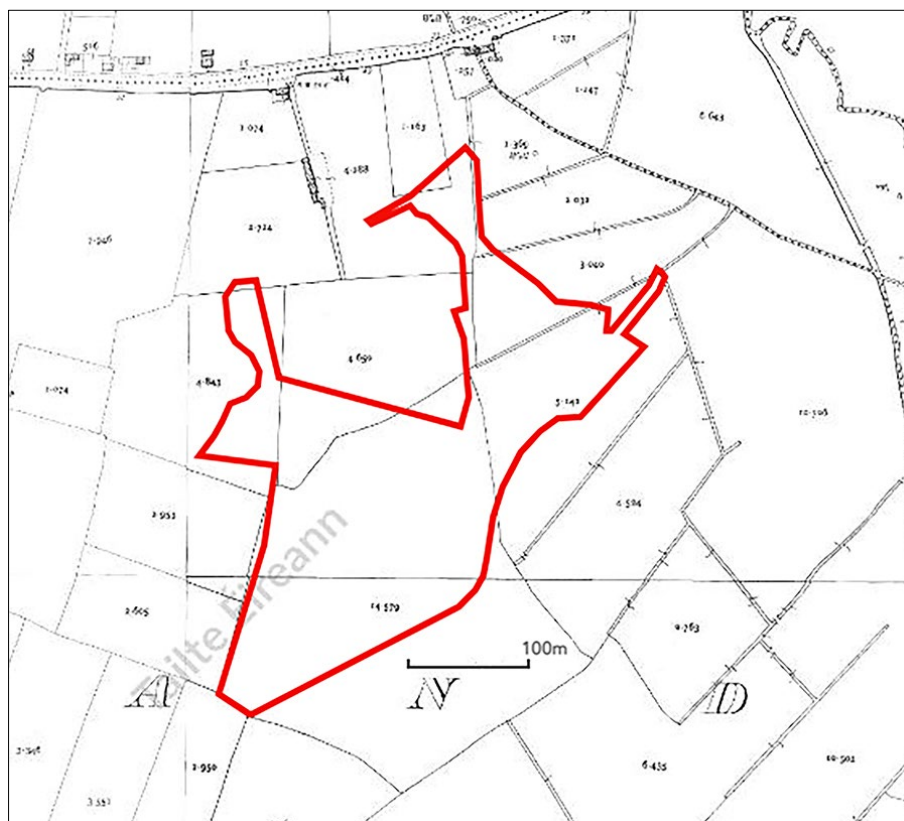


Figure 12-8 Extract from 2nd Edition Ordnance Survey (OS) 6-inch map (1900), showing location of site



12.3.8.1 Aerial Imagery

A review of available aerial photography was undertaken as part of this assessment. Aerial photographs dating between 1995 and 2005 from Tailte Éireann and Google Earth imagery dating between 2007 and 2025 were assessed (Figs 12.9 to 12.11).

An aerial image from 1995 shows that the field layout has remained almost the same as that depicted on the 25 inch map of 1900, with the exception of a new field boundary in the largest field. The new roadway at north has yet to be constructed. No potential archaeological features were noted.

Aerial imagery from 2001–2005 (figure 12.10) shows a small adjustment in the northern field boundary, and a possible spoil heap at the northwest side of the site.

A Google Earth image from 2007 (figure 12.11) shows construction of the previous permitted development underway, with the subject site almost completely stripped of topsoil.

12.3.9 Topographical Files

The Topographical Files of the National Museum of Ireland were consulted. No finds were recorded for the townland of Singland.

12.3.10 Field Inspection

A site inspection was carried out by the writer in 28 April 2026. The majority of the subject Site was previously built on. The area surrounding the area of the structure (now partially demolished) was previously disturbed during construction works and is now overgrown. No previously unrecorded archaeological features, or features of cultural heritage interest were noted.

Figure 12-9 Aerial view of site 1995.



RECEIVED: 28/05/2026

Figure 12-10. Aerial view of site Map Genie 2001-2005.



Figure 12-11. Aerial view of site Google Earth 22 September 2007.



12.4 Characteristics of the Proposed Development

The Proposed Development comprises five residential apartment blocks with a total of 403 no. residential units, ranging from five to eight storeys in height; a medical centre located at the western edge of the site; a creche located at ground level within Block B; and all associated site works and development. The current proposals also extend to the R445 to accommodate a proposed entrance from the R445. They will also include a proposed nature-based surface water drainage solution within the neighbouring Groody Valley green wedge. For a more comprehensive understanding of the Proposed Development, please refer to Chapter 2 (Description of the Proposed Development) of the EIA Report. Chapter 2 provides a detailed overview of the lifecycle of the project, including reference to the architectural and civil engineering, drawings, plans, reports, and other relevant documents in order to define the Proposed Development.

The effect on archaeological and cultural heritage will be during the construction stage. The main source of archaeological effects will be as a result of the groundworks associated with the construction. The groundworks have the potential to impact on unknown archaeological features that might be present within the site if not appropriately mitigated. If appropriately mitigated at the construction stage there will be no effects during the operational phase.

12.5 Potential Impacts of the Proposed Development

12.5.1 Construction Phase

12.5.1.1 Archaeological Heritage

There will be no effects, direct or indirect, on recorded archaeological monuments. There are no monuments, as listed in the Record of Monuments and Places (RMP) or in the Sites and Monument Record (SMR), located within the site.

A potential direct effect on the archaeological resource lies in the uncovering of sub-surface archaeological features during groundworks associated with the Proposed Development and related infrastructure within the eastern and northeastern side of the site. However, this side of the site has been disturbed during the previous construction phase, and so there is only a small chance of previously unrecorded small isolated archaeological features being uncovered.

Should previously unknown archaeological features be present within the site, the Proposed Development will have a direct, negative, permanent and profound or very significant effect on such remains. The effect on archaeological heritage will need to be mitigated at construction phase.

12.5.1.2 Architectural and Cultural Heritage

There will be no effects, direct or indirect, on recorded architectural heritage as no Protected Structures or sites listed within the National Inventory of Architectural Heritage (NIAH) are located within the site.

12.5.1.3 Indirect Effects

Indirect effects are those whereby the Proposed Development may have a negative (or positive) effect on the wider archaeological landscape or surrounding architectural and cultural heritage. Indirect effects may include a visual impact on the surrounding archaeological and/or architectural landscape.

The introduction of the Proposed Development to the area will result in no effect on the setting of any Recorded Monuments or Protected Structures as none are present within the Site.

12.5.2 Operational Phase

There will be no effect on archaeological and cultural heritage during the operational phase.

12.6 Mitigation Measures

12.6.1 Archaeological Heritage

The predicted effects on the known archaeological heritage (SMRs/RMPs) are regarded as being none. There will be no indirect or visual effects on Recorded Monuments as none are present within the site.

A potential direct effect on previously unknown archaeological heritage lies in the uncovering of sub-surface remains. Accordingly, the following mitigation measures will be carried out subject to the approval of the National Monuments Service (NMS) of the Department of Housing, Local Government and Heritage (DHLGH),:

- ▶ Archaeological monitoring at construction phase of the area of the site outside of the previously partially constructed building (see Figure 12-12 below). Should any further archaeological features, deposits or artefacts be identified during the course of the development, works in that area should be halted and the appropriate authorities informed. The archaeological remains will be preserved *in situ* or by record (excavation) following consultation with the National Monuments Service.
- ▶ A report is required to be compiled on completion of archaeological monitoring, and any archaeological excavation (if necessary) and will be submitted to the relevant authorities.

Figure 12-10 Location of area proposed for archaeological monitoring at construction stage in blue (Landsat 2025).



4.6.2 Architectural and Cultural Heritage

The predicted effects on the known architectural heritage are regarded as being none. No effects on Protected Structures (RPS) or sites in the National Inventory of Architectural Heritage (NIAH) were identified, and no indirect or visual effects on the nearest such site outside the Proposed Development site boundary were noted.

12.7 Residual Effects of the Proposed Development

The residual impacts are likely to be neutral and none to imperceptible if the mitigation measures are implemented. The table below summarizes the residual effects of the Proposed Development on the archaeological, architectural and cultural heritage landscape. Residual impacts are defined as the overall effect of the development on archaeology, architectural and cultural heritage, on the basis of implementing the mitigation measures outlined in this report.

Table 12-1. Residual Effects of the Proposed Development Table

Potential Effects	Mitigation Strategy	Residual Impacts
Construction Effects		
Effects on Recorded Monuments - none	No effect, as no Recorded Monuments within the site.	None
Effects on previously unknown archaeological, architectural and cultural heritage sites – Groundworks and service trenches, etc.	Archaeological monitoring of the eastern and northeastern portion of the site. Consultation with the Licensing Section of the National Monuments Service should be undertaken if archaeological sites or features are uncovered. Excavation of any archaeological features identified.	None
Effects on Protected Structures - none	None	None
Operational Effects		
None	None	None

12.8 Cumulative Effects of the Proposed Development

Cumulative effects include the combined effects of multiple developments or activities on a range of receptors, in this case, archaeological monuments and architectural/cultural heritage sites.

There are no significant cumulative effects on the archaeological and cultural heritage resource of the area as a result of the Proposed Development. There are no predicted effects on the known archaeological and architectural features of the site and the surrounding area.

Subject to the implementation of the appropriate mitigation measures during the construction phase, it is predicted that there will be no residual effects on the archaeological, architectural and cultural heritage and therefore no possibility of cumulative effects in combination with other plans or projects.

12.9 Summary of Significant Effects

Should previously unknown archaeological, architectural or cultural heritage features be present within the footprint of the Proposed Development, it will likely result in the permanent loss of these remains once mitigation (preservation by record/excavation) is applied, and, as such, the magnitude of the effect is profound or very significant.

12.10 Monitoring or Reinstatement Measures

No monitoring or reinstatement measures will be necessary as all effects on archaeological, architectural and cultural heritage features will be mitigated at the pre-construction or during construction phase.

RECEIVED: 28/05/2026

12.11 References

- ▶ Coyne, F. (2025) Archaeological Impact Assessment Report at Singland, Co. Limerick; unpublished report by Aegis Archaeology Ltd.
- ▶ Database of Irish Excavation Reports (www.excavations.ie, accessed July 2025).
- ▶ Environmental Protection Agency (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (https://www.epa.ie/publications/monitoring--assessment/assessment/EIAR_Guidelines_2022_Web.pdf; accessed July 2025).
- ▶ European Commission (2017) Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report.
- ▶ Griffiths Valuation by the National Library of Ireland (<https://www.askaboutireland.ie/griffith-valuation/>, accessed April 2026).
- ▶ Historic Environment Viewer (<https://heritagedata.maps.arcgis.com/apps/webappviewer>, accessed July 2025).
- ▶ Irish Townland and Historical Map Viewer (<https://osi.maps.arcgis.com/apps/webappviewer/>, accessed April 2026).
- ▶ National Inventory of Architectural Heritage Database (<https://www.buildingsofireland.ie/>, accessed July 2025).
- ▶ National Monuments in State Care: Ownership and Guardianship, Limerick (4 March 2009) (<https://www.archaeology.ie/app/uploads/2025/03/monuments-in-state-care-waterford.pdf>, accessed July 2025).
- ▶ National Monuments Service (<https://www.archaeology.ie/>, accessed April 2026).
- ▶ Placenames Database of Ireland (<https://www.logainm.ie/en/>, accessed July 2025).
- ▶ Record of Monuments and Places for County Limerick (1997)
- ▶ Record of Protected Structures; Appendix 9 (chrome-extension://efaidnbmninnibpcapjpcglclefindmkaj/https://www.limerick.ie/sites/default/files/media/documents/2025-04/3a-record-of-protected-structures-metropolitan-district-rev-a_0.pdf, accessed April 2026).
- ▶ The Down Survey of Ireland by Trinity College Dublin (<https://www.downsurvey.iel>, accessed April 2026).
- ▶ Limerick Development Plan 2022–2028. (<https://www.limerick.ie/council/services/planning-and-placemaking/development-plan-strategies/limerick-development-plan-0>, accessed April 2026).



RECEIVED: 28/05/2026

Chapter 13 – Material Assets – Traffic and Transportation

TABLE OF CONTENTS

13. MATERIAL ASSETS – TRAFFIC AND TRANSPORTATION	13-1
13.1 Introduction.....	13-1
13.2 Methodology	13-1
13.2.1 Difficulties Encountered	13-2
13.3 Receiving Environment	13-2
13.4 Characteristics of the Proposed Development.....	13-6
13.5 Potential Impacts of the Proposed Development	13-8
13.5.1 Construction Phase	13-8
13.5.2 Operational Phase	13-9
13.6 Mitigation Measures.....	13-10
13.6.1 Construction Phase	13-10
13.6.2 Operational Phase.....	13-11
13.7 Monitoring or Reinstatement Measures	13-11
13.7.1 Construction Phase	13-11
13.7.2 Operational Phase.....	13-12
13.8 Residual Effects of the Proposed Development.....	13-12
13.8.1 Construction Phase	13-12
13.8.2 Operational Phase.....	13-12
13.9 Cumulative Impacts of the Proposed Development	13-12
13.10 References.....	13-19

LIST OF TABLES

Table 13-1 Traffic Survey AM/PM Peak Times	13-3
Table 13-2. Existing Local Bus Routes	13-5
Table 13-3 Estimated AM and PM peak hour traffic (PCUs) generated by the Proposed Development using TRICS	13-7
Table 13-4 Estimated AM and PM peak hour (Passenger Car Units (PCUs)) generated by Construction Traffic versus Existing Background Traffic	13-8
Table 13-5 Estimated AM and PM peak hour (Passenger Car Units (PCUs)) generated by Proposed Development versus Existing Background Traffic	13-9
Table 13-6 Summary Results of all Surrounding Junctions	13-10
Table 13-7. Adjacent Planning Applications Reviewed for Traffic Impact	13-12
Table 13-8. Estimated AM and PM peak hour traffic (PCUs) generated by Option 1 of the Masterplan with Primarily Employment / Commercial Further Development using TRICS	13-17
Table 13-9. Estimated AM and PM peak hour traffic (PCUs) generated by Option 2 of the Masterplan with Primarily Employment / Commercial Further Development using TRICS	13-17
Table 13-10. Summary Results of all Surrounding Junctions with Masterplan Assessment	13-17

LIST OF FIGURES

Figure 13-1 Junction Turning Count Locations	13-2
Figure 13-2 Limerick Proposed Cycle Network as per LSMATS	13-4
Figure 13-3 Bus Stop Locations in Relation to Site Location	13-5
Figure 13-4 Proposed BusConnects Limerick	13-6

13. MATERIAL ASSETS – TRAFFIC AND TRANSPORTATION

13.1 Introduction

This chapter presents the likely and significant impacts associated with the material asset (Traffic and Transport) environments associated with the Proposed Development.

The purpose of this chapter is to assess the impact of the Proposed Development on the surrounding road network and transport infrastructure on the Dublin Road. The assessment is not only relating to the potential impact of traffic anticipated from the Proposed Development but also the projected increase in traffic in the area from the future build out of the entire masterplan site.

13.2 Methodology

A Traffic and Transportation Assessment (TTA) was completed for the planning application submission and the results of the assessment have informed this chapter. The TTA is included as Appendix 13.1 of this chapter.

The assessment is based on the following documents which outline the methodology required for traffic assessments:

- TII's Traffic and Transport Assessment Guidelines PE-PDV-02045 (May 2014)
- TII Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections (PE-PAG-02017 October 2021)
- Design Manual for Urban Roads & Streets (DMURS).
- Sections from the Limerick Development Plan (2022-2028)
- Cycle Design Manual (September 2023)

Site visits were made at various dates in 2025 and 2026 to review the character and issues associated with the surrounding road network.

The scope of the TTA was discussed and agreed with Limerick City & County Council Engineering representatives.

Traffic surveys at 4 junction locations (refer to Figure 13-1) were undertaken on Thursday 13th of March 2025 to establish baseline traffic flows on the existing road network. Surveys on a Thursday during school term are generally considered representative of peak traffic times for residential developments.



Figure 13-1 Junction Turning Count Locations

The impact of the Proposed Development was assessed using Junctions 9 software analysis for priority-controlled junctions and Linsig software analysis for signal-controlled junctions by comparing the baseline traffic flows with the Proposed Development added up to two Design Years – 2033 and 2043.

A public transport capacity occupancy survey was undertaken on Tuesday 16th September 2025 at 2 no. bus stops in close proximity to the Site as per industry practice. The results of the survey capacity were compared to the potential future additional commuters using the service from the Proposed Development.

A DMURS Quality Audit including Stage 1 & 2 Road Safety Audit has been carried out by an independent auditor on the Proposed Development and surrounding network. The auditor visited the Site and reviewed the Proposed Development drawings for safety concerns relating to roads and active travel measures in the Proposed Development. The recommendations of the audit have been incorporated into the design proposals for the Proposed Development, where possible.

13.2.1 Difficulties Encountered

No significant difficulties were encountered in completing this chapter.

13.3 Receiving Environment

13.3.1.1 Site Location

The Site is located at Singland, Limerick, on the south side of the Dublin Road, adjacent to Parkway Retail Park and approximately 4 km east of Limerick City Centre. The 6.18-hectare brownfield site is bounded by the Dublin Road to the north, greenfield lands to the east and southeast, residential properties to the southwest, and Parkway Valley Retail Park to the west.

Previous construction for a mixed-use development was commenced but not completed; all structures have since been demolished except for a retaining wall along the western boundary. The Site now comprises a gravel surface with generally flat ground levels ranging from 8.4mAOD to 9.64mAOD. Access is provided via an existing entrance from the Parkway Retail Park Roundabout to the west.

13.3.1.2 Road Network

Dublin Road (R445) forms the northern boundary of the Proposed Development Site. It is a dual carriageway with two lanes in each direction and carries high traffic volumes, with an AADT of approximately 22,000 vehicles in 2019 and a projected 26,900 vehicles in 2025. The road provides direct access between Limerick City Centre and the M7 motorway, serving as a key regional route.

To the west, the Parkway Roundabout (Junction 1) provides a five-arm junction connecting the Dublin Road (east/west), Childers Road (R509), Bóthar Bhaile Átha Cliath, and access to Parkway Shopping Centre. Further east, the Groody Roundabout (Junction 4) connects Dublin Road with Groody Road and Plassey Park Road, providing access to University of Limerick, Annacotty, and Monaleen. These roads generally feature two-way carriageways with good connectivity to the local and regional network.

The traffic survey completed in March 2025 found that the AM & PM Peaks for each of the survey sites were varied as set out in Table 13-1.

Table 13-1 Traffic Survey AM/PM Peak Times

Development Type	AM Peak	PM Peak
Junction 1: Parkway Roundabout	10:45 – 11:45	12:00 – 13:00
Junction 2: Dublin Road/Parkway Retail Park Signalised Intersection	10:30 – 11:30	15:30 – 16:30
Junction 3: Parkway Retail Park Roundabout	11:00 – 12:00	13:30 – 14:30
Junction 4: Groody Roundabout	07:45 – 08:45	16:00 – 17:00

A junction capacity analysis of the existing 2025 traffic flows was carried out with the following results:

- ▶ Junction 1 (Parkway Roundabout) is shown to be operating currently at 0.84 and 0.91 of the junction capacity during the AM and PM peak period respectively during the survey year 2025. The Childers Road arm of the junction is where the most vehicle queueing is observed.
- ▶ Junction 2 (Dublin Road/Parkway Retail Park Signalised Intersection) is shown to be operating at a Maximum Degree of Saturation (DOS) of 53.1% and 56.4% during the AM and PM peak period respectively during the survey year 2025.
- ▶ Junction 3 (Parkway Retail Park Roundabout) is shown to be operating at 0.21 and 0.25 of the junction capacity during the AM and PM peak period respectively during the survey year 2025. Minimal queueing is observed on each arm. There are no existing issues with capacity at this junction as it mostly serves as access in and out of the Parkway Retail Park with no conflicting movements.
- ▶ Junction 4 (Groody Roundabout) is shown to be operating at 0.93 and 0.87 of the junction capacity during the AM and PM peak period respectively during the survey year 2025.

The design threshold for roundabouts and priority-controlled junctions is a Ratio of Flow to Capacity (RFC) of 0.85. The design threshold for signal-controlled junctions is 90% Degree of Saturation (DOS).

Junctions 2 & 3, located at the Parkway Retail Park, are operating within normal design thresholds.

The Parkway and Groody Roundabouts on the Dublin Road are already performing at or above the design threshold during the peak times assessed. It is considered that in urban areas a certain level of congestion is to be expected during peak times.

13.3.1.3 Pedestrian Facilities

Pedestrian infrastructure in the area is generally good, with footpaths provided on both sides of the Dublin Road, Childers Road, Bóthar Bhaile Átha Cliath, Groody Road, and Plassey Park Road. Uncontrolled pedestrian crossings are provided at key junctions, including the Parkway Roundabout (zebra crossing) and the Groody Roundabout area. These facilities offer safe pedestrian movement between the retail, residential, and institutional areas surrounding the Site.

13.3.1.4 Cycling Facilities

Dedicated cycle facilities are limited along the Dublin Road, except for small waiting areas at the signalised junction to Parkway Retail Park. However, designated cycle lanes are present along Childers Road (R509), Bóthar Bhaile Átha Cliath, Groody Road, and Plassey Park Road, including two-way cycle lanes on the latter two routes. These provide key cycling connections between the University of Limerick, residential areas, and the wider city network.

The National Transport Authority (NTA) published LSMATS to set out the framework for the delivery of the transport system developments. Under the strategy, cycling infrastructure will be developed along several primary routes. Portions of the Dublin Road are designated as primary cycle routes, while other sections are classified as secondary. Refer to Figure 13-2 below. The timeline of the delivery of this cycle infrastructure is currently unknown.

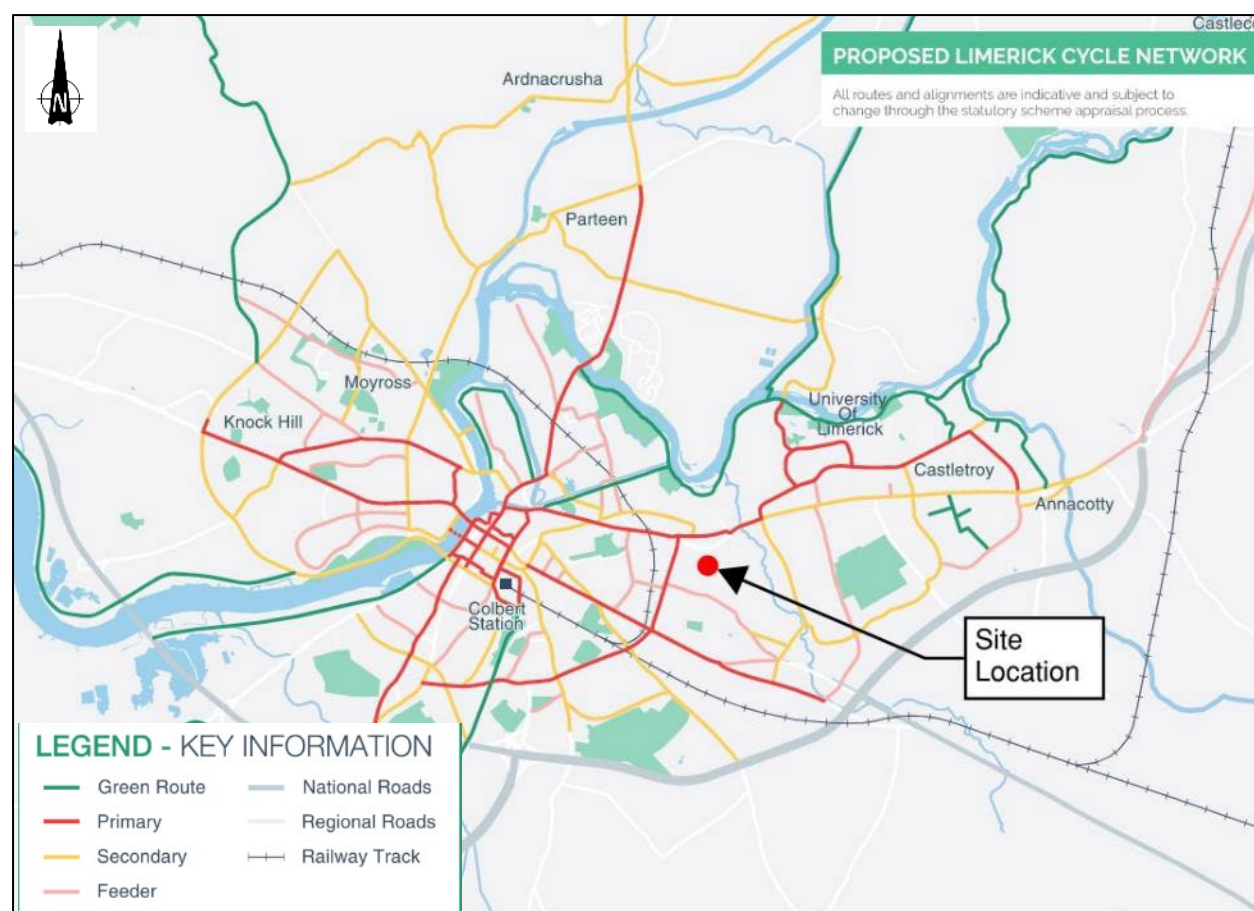


Figure 13-2 Limerick Proposed Cycle Network as per LSMATS

13.3.1.5 Public Transport Facilities

The Site is well served by the existing bus network with 3 no. Bus Éireann routes passing the Site along the Dublin Road namely Route 304 (Ballycummin - University of Limerick), Route 304A (Raheen University Hospital Limerick - University of Limerick) and Route 323 (City Centre - Castleconnell).

Figure 13-3 below, shows the location of all the Bus Stops within 500m and 1km of the Proposed Development. Table 13-2 below includes the frequency (in each direction) of bus routes in close proximity to the Proposed Development.

Table 13-2. Existing Local Bus Routes

Number	Route	Provider	Weekday Frequency	Sat/ Sun Frequency
304	Ballycummin -UL	Bus Éireann	15 min	15/30 min
304A	Raheen UHL - UL	Bus Éireann	30 min	30 min
309	Kilduff - Glentworth	Kelly Travel	Tuesday – Friday One Trip	Saturday One trip
310	City Centre – National Technology Park	Dublin Coach	30 min	30 min
323	City Centre - Castleconnell	Bus Éireann	3 hours	3 hours
323X	Limerick - Birr - Athlone	Bus Éireann	One trip	N/A
332	Limerick - Killaloe - Nenagh - Birr	Bus Éireann	2 – 21/2 hours	21/2 – 3 hours



Figure 13-3 Bus Stop Locations in Relation to Site Location

A public transport capacity occupancy survey was undertaken on Tuesday 16th September 2025 at 2 no. bus stops in close proximity to the site as per industry practice. The overall survey results indicate an average occupancy of 53% during the morning period, 69% during the evening period, and an overall occupancy of 60%.

BusConnects Limerick is a strategy developed by the National Transport Authority (NTA) to greatly improve bus services in Limerick City. The aim of BusConnects is to “deliver an enhanced bus system that is better for the city, its people and the environment” (busconnects.ie). At the time of writing, the Bus Connects website notes that the new network is scheduled to be delivered on a phased approach from 2027.

The proposed network is shown in Figure 13-4 below. The following routes are proposed near the development:

- ▶ Bus route (no.2) located 900 south of the Proposed Development. This route will operate with a 15-minute frequency and will connect Moylish to UL North Campus.
- ▶ Bus route (no.4) also located on Dublin Road. This route will connect St Nessen’s Church to University of Limerick and will operate with a 10-minute frequency.
- ▶ Bus route (no. 6). which is located along Dublin Road. This route will connect Coonagh Shopping Centre and University of Limerick at 30-minute frequencies.

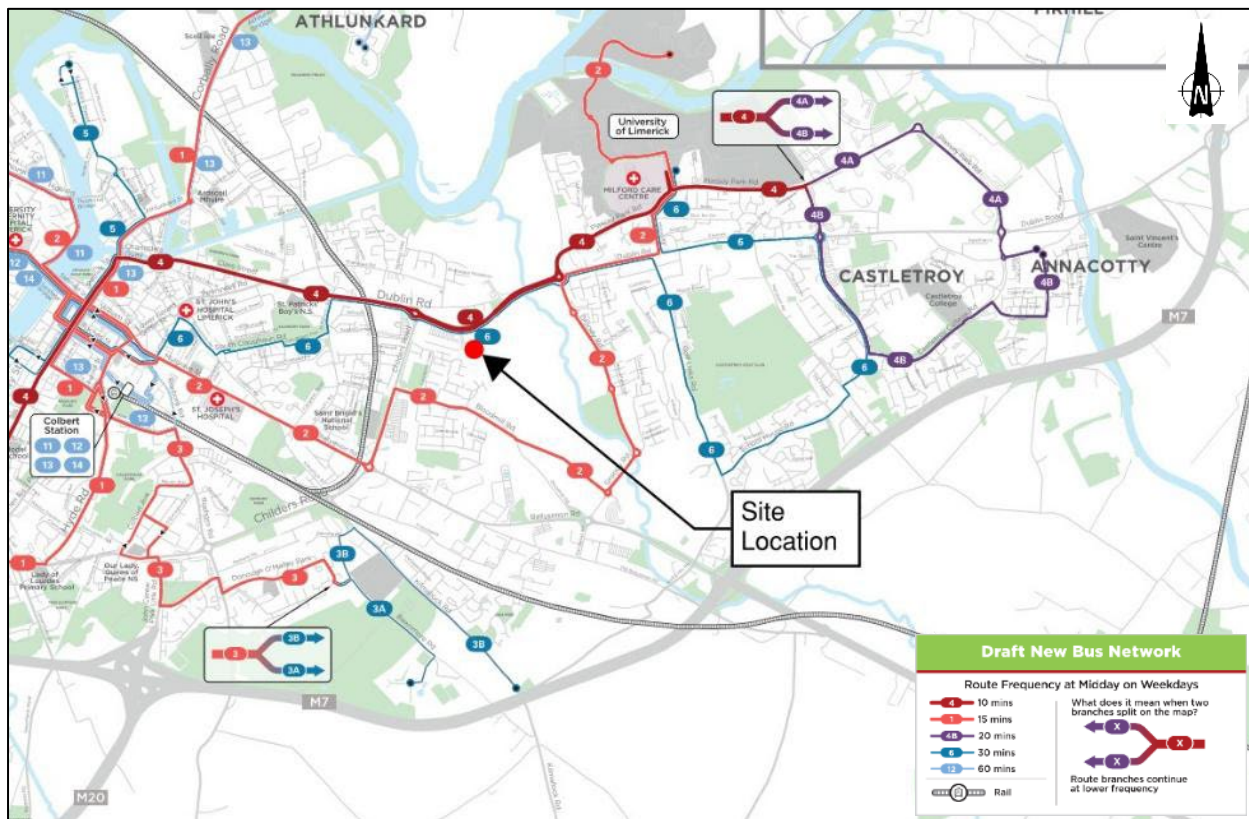


Figure 13-4 Proposed BusConnects Limerick

The Limerick Colbert train station is located 2.5km from the Proposed Development Site. This offers reliable intercity transport to Dublin, Galway, Waterford, Cork and Tralee.

13.4 Characteristics of the Proposed Development

The purpose of this section is to provide an overview of the key relevant details of the construction phase and operational phase relating to traffic and transportation elements of the Proposed Development. The information presented in this section is informed by the project design, but it is not a complete description of the Proposed Development. Therefore, it should be read in conjunction with the full development package. For a more comprehensive understanding of the Proposed Development, please refer to Chapter 2 (Description of the Proposed Development) of the EIA Report.

It is planned to access the Proposed Development via a new vehicular site entrance off the Dublin Road (R445) and via the existing Parkway Retail Park Roundabout. The new vehicular entrance will operate as a Left-In/Left-Out (LILO) junction arrangement facilitating left-turn ingress and egress movements only.

It is proposed to provide 138 no. car parking spaces on the development Site. 12 no. spaces will be accessible and a minimum of 20% will have EV chargers. All spaces will be cabled for future EV use. 5 no. parking spaces will be dedicated for car club use only in this car space provision.

In order to estimate the likely volumes of traffic that will be generated by the Proposed Development, trip rates recommended by TRICS (Trip Rate Information Computer System) were extracted from the database and applied pro-rata to the relevant number of residential apartments and gross floor area of commercial units within the development. The estimated AM and PM peak hour traffic (PCUs) generated by the Proposed Development are presented in Table 13-3.

Table 13-3 Estimated AM and PM peak hour traffic (PCUs) generated by the Proposed Development using TRICS

Land Use	Calculation Factor		Trip rate				Additional Number of Trips			
			AM Peak		PM Peak		AM Peak		PM Peak	
	No. of Units	GFA (m2)	Arrive	Depart	Arrive	Depart	Arrive	Depart	Arrive	Depart
Residential Units	403		0.048	0.138	0.116	0.067	19	56	47	27
Creche		306	2.562	2.194	1.894	2.450	8	7	6	7
Medical Centre		3,082	0.486	0.581	0.571	0.624	15	18	18	19
Total							42	80	70	54

The Proposed Development will provide high quality pedestrian and cyclist access which will promote sustainable transport usage.

As the potential for pedestrian trips to and from the development is high, it is important that the development is properly integrated into the existing footpath network. There are footpaths already along Dublin Road and the Parkway Retail Park access road. A new pedestrian link is being proposed from Dublin Road in addition to the existing access from Parkway Retail Park roundabout. These footpaths further link to a broader network within Limerick City Centre, facilitating easy pedestrian access.

The Site is in close proximity to Parkway Retail Park with a walking time of less than 2 minutes.

The bus stops are situated within a 30-minute walking distance from the Site, making the combination of walking and bus commuting an excellent option for residents, creche and medical facility workers.

The Public Transport Capacity Assessment Report demonstrates that the Proposed Development Site is well served by public transport with large capacity, and frequent services. The existing bus network has sufficient capacity to accommodate passenger trips generated from the Proposed Development Site.

It is proposed to provide 818 no. secure cycle parking spaces on the Proposed Development Site. Cycle parking will be monitored, and additional cycle parking provided if required in the future.

13.5 Potential Impacts of the Proposed Development

13.5.1 Construction Phase

Construction traffic travelling to the Site will use the Dublin Road and the Parkway Retail Park roundabout to the west of the proposed Site for access.

Construction workers will vary greatly over the construction period. At peak times there is estimated to be a maximum of 100-150 staff working on the Site. Construction work will typically start and finish outside of the peak traffic times on the surrounding road network. Vehicle parking for construction personnel will be accommodated within the Site. To the extent possible, personnel will also be encouraged to use public transport, and information on local public transportation will be published on Site.

Approximately 37,000m³ of existing made ground and subsoil will need to be excavated and removed from site which will require an approximate total number of 4,100 HGV loads.

The superstructure of the buildings will be piled which will result in approximately 700m³ of arisings from the piling process which will require an approximate total number of 75 HGV loads.

Following the installation of the piles to improve the ground material, hardcore fill with an approximate volume of 50,000m³ will then be backfilled to building and road formation level resulting in approximately 5,500 HGV loadings to the Site.

This formation level and ground improvement process will be spaced over an approximate 180-day period at the start of the project resulting in a maximum of 20-50 HGVs per day during the busiest period of construction. Refer to Table 13-4 for comparison of predicted maximum construction traffic expected in the peak hours versus the existing background traffic.

Table 13-4 Estimated AM and PM peak hour (Passenger Car Units (PCUs)) generated by Construction Traffic versus Existing Background Traffic

Site	Junction	Trips Generated (PCUs)		Background Traffic (PCUs)	Percentage
1	Parkway Roundabout	AM	10	2,938	0.3%
		PM	10	3,020	0.3%
2	Dublin Road/Parkway Retail Park (Signal-Controlled)	AM	20	2,042	1.0%
		PM	20	2,178	0.9%
3	Parkway Retail Park Roundabout	AM	20	457	4.4%
		PM	20	510	3.9%
4	Groody Roundabout	AM	10	3,308	0.3%
		PM	10	3,477	0.3%

The traffic volume associated with the construction phase is not considered to be excessive when compared to the baseline traffic volumes carried out in September 2025 and will be spread out over the duration of the construction period of the Proposed Development.

As the construction works are off-line and due to the designated access point, which allows delivery vehicles to pull off into the Site, there will be no significant disruption to the traffic flows on the Dublin Road or at the Parkway Valley Retail Park roundabout as a result of the construction of the development. It is not envisaged that any diversions will be required.

Existing public footpaths and cycling facilities in the vicinity of the Proposed Development Site will be unaffected during construction phase.

The Proposed Development will have a potential impact ranging from *negative slight temporary*, during peak construction, and expected to reduce to *negative short-term not-significant* impact to local traffic during the construction phase.

13.5.2 Operational Phase

A total of 138 no. car parking spaces are proposed for the development. The convenient accessible location of the Site supports sustainable transport usage and will therefore not generate high levels of vehicular traffic in the area.

It is proposed to provide 818 no. secure cycle parking spaces on the Proposed Development Site. Cycle parking will be monitored, and additional cycle parking provided if required in the future.

As noted in Section 13.3.1.2, cycling facilities in the area will be improved with the provision of a Primary Radial Cycle Route along the Dublin Road (R445) as identified in the Limerick Shannon Metropolitan Area Transport Strategy (LSMATS). This project will deliver dedicated cycle lanes passing the Site from the City Centre to the University of Limerick and National Technology Park. The timeline of the delivery of this cycle infrastructure is currently unknown.

A public transport capacity occupancy survey was undertaken on Tuesday 16th September 2025 at 2 no. bus stops in close proximity to the site as per industry practice. The overall survey results indicate an average occupancy of 53% during the morning period, 69% during the evening period, and an overall occupancy of 60%. The results of the public transport capacity occupancy survey were compared to the potential future additional commuters using the service from the Proposed Development. It was found that there is adequate capacity within the existing services to accommodate the Proposed Development.

Additionally, as noted in section 13.3.1.2, two proposed new BusConnects routes due to be delivered on a phased approach from 2027 will run via Dublin Road passing directly outside the perimeter of the Proposed Development. These bus routes will provide a quick and sustainable means of transport for residents and users of the Site.

Table 13-5 shows that the Estimated AM and PM peak hour overall traffic generated by the Proposed Development will have a minimal impact on the surrounding external junctions with the Proposed Development in operation.

Table 13-5 Estimated AM and PM peak hour (Passenger Car Units (PCUs)) generated by Proposed Development versus Existing Background Traffic

Site	Junction	Trips Generated (PCUs)		Background Traffic (PCUs)	Percentage
1	Parkway Roundabout	AM	66	2,938	2.3%
		PM	62	3,020	2.1%
2	Dublin Road/Parkway Retail Park (Signal-Controlled)	AM	123	2,042	6.0%
		PM	124	2,178	5.7%
3	Parkway Retail Park Roundabout	AM	123	457	26.9%
		PM	124	510	24.3%
4	Groody Roundabout	AM	56	3,308	1.7%
		PM	62	3,477	1.8%

Where development-generated traffic represents less than 5% of existing background traffic, it is considered to have no significant impact on junction performance. For the current development proposals, traffic volumes equate to less than 5% of background traffic at Junction 1 (Parkway Roundabout) and Junction 4 (Groody Roundabout). Accordingly, detailed junction capacity modelling is not specifically required, as the anticipated development trips would have minimal effect on these junctions.

For completeness, capacity assessment of the 4 No. surrounding junctions was carried out. The 2043 predicted worst-case results are shown in the Table 13-6 below.

Table 13-6 Summary Results of all Surrounding Junctions

Number	Route	2043 Without Development RFC/DOS	2043 With Development RFC/DOS
1	Parkway Roundabout	115%	117%
2	Dublin Road/Parkway Retail Park (Signal-Controlled)	67%	88%
3	Parkway Retail Park Roundabout	30%	30%
4	Groody Roundabout	113%	116%

The design threshold for roundabouts and priority-controlled junctions is a Ratio of Flow to Capacity (RFC) of 0.85. The design threshold for signal-controlled junctions is 90% Degree of Saturation (DOS).

Junctions 2 & 3, located at the Parkway Retail Park, are operating well within normal design thresholds.

The Parkway and Groody Roundabouts on the Dublin Road are predicted to be performing above the design threshold in the design year 2043, however they are predicted to do so also without any further development. It is considered that in urban areas a certain level of congestion is to be expected during peak times.

From the above modelling results we conclude that the surrounding road network and adjacent existing junctions/roundabouts will have little comparable impact on the current operational capacity of the surrounding network of roads and junctions.

Overall, at operational phase, there is potential to be a *long-term neutral not significant* impact on the surrounding roads as a result of the Proposed Development.

13.6 Mitigation Measures

13.6.1 Construction Phase

The following mitigation measures are proposed for the construction phase of the Proposed Development with reference to Material Assets: Traffic and Transport:

1. To address the potential Construction Phase impacts, the appointed Contractor shall prepare a Construction Transport Management Plan (CTMP) prior to the commencement of development. All deliveries shall be provided with instructions/directions on accessing the site from the Dublin Road, and deliveries shall be scheduled outside of peak commuting hours.

Construction operations on site and deliveries to the site will be in accordance with the Construction and Environmental Management Plan (CEMP).

The preparation of the CTMP will entail an assessment of existing nearby employment, educational, recreational and commercial facilities to establish the peak times for vehicles, cyclists and pedestrians.

This information would be used to develop the optimum start/finish/delivery times to minimise impact on these existing facilities.

The CTMP issued at construction stage would identify haulage routes and restrictions as appropriate in discussion with the Local Authority. There will also be a requirement for comprehensive measures as part of the construction management.

2. To address the potential Construction Phase impacts, the construction vehicle movements will be minimised through:
 - a) Consolidation of delivery loads to/from the site and manage large deliveries on site to occur outside of peak traffic periods;
 - b) Use of precast/prefabricated materials where possible;
 - c) 'Cut' material generated by the construction works will be re-used on site where possible, through various accommodation works;
 - d) Adequate storage space on site will be provided;
 - e) A strategy will be developed to minimize construction material quantities as much as possible;
 - f) Construction staff vehicle movements will also be minimized by promoting the use of public transport, shared use of vehicles, cycling and walking.

With the implementation of these mitigation measures during the construction phase, the severity of the impact of the Proposed Development on the traffic and transportation will be minimised.

13.6.2 Operational Phase

The design, construction and operation of site access, internal roads and associated infrastructure in accordance with relevant design standards (including DMURS, Limerick Development Plan (2022-2028) and the Cycle Design Manual) ensure the safe and efficient accommodation of development-generated traffic and will minimise potential impacts on the surrounding road network during the operational phase.

13.7 Monitoring or Reinstatement Measures

13.7.1 Construction Phase

The contractor will be obliged to appoint a traffic liaison officer/traffic manager who will be involved in preparing the CTMP and to monitor the performance of the CTMP. The traffic liaison officer will be available to receive complaints, comments and queries about the traffic generated by the construction site and traffic issues associated with the site. Regular meetings will be held on-site to which with all relevant stakeholders will be invited. The traffic liaison officer/traffic manager will liaise with:

- ▶ Limerick City & County Council including Elected Members
- ▶ An Garda Síochána
- ▶ Irish Rail
- ▶ Bus Éireann
- ▶ Other relevant statutory bodies
- ▶ Members of the community
- ▶ Adjacent contractors

The traffic liaison officer/traffic manager will be sufficiently senior in position and will be responsible for dealing with any complaints and remedying any non-compliance and developing solutions to prevent re-occurrence.

13.7.2 Operational Phase

There will be no monitoring requirements of the traffic and transport in the operational phase of the development.

13.8 Residual Effects of the Proposed Development

13.8.1 Construction Phase

Given the short-term nature of the traffic increase, the mitigation measures set out above will ensure that no significant residual effects arise. In summary:

- ▶ A Construction Environmental Management Plan (CEMP) will minimise traffic impacts during the construction phase as far as practicable.
- ▶ Any increase in construction-related traffic will be temporary and will occur outside peak periods.

Overall, with mitigation in place, the construction phase traffic impact is expected to be not significant, negative and short-term.

13.8.2 Operational Phase

With the design, construction and operation of site access, internal roads and associated infrastructure in accordance with relevant design standards as set out in the mitigation measures above, residual impacts on the surrounding traffic and transportation during the operational phase is considered to be a *long-term neutral* and *imperceptible* impact.

13.9 Cumulative Impacts of the Proposed Development

Adjacent planning consents/applications granted/submitted in the area have been reviewed and none are considered to have a potential significant impact on the traffic assessment for the Proposed Development as presented in Table 13.7.

Table 13-7. Adjacent Planning Applications Reviewed for Traffic Impact

Application details	Description	Decision & Date	Include/Exclude in TTA
Applicant: Bloodmill Road Estates Limited Reference: 201235 Location: Bloodmill Road, Singland, Co. Limerick	Alterations to previously approved Planning ref no. 18/434. The alterations consist of alteration to design of Creche to provide a reduced floor area, addition of 3 semi-detached houses together with associated site works.	Decision: Grant Permission (with Conditions) Date: 27/04/2021	Exclude: The Planning Report included as part of the planning submission stated that the Proposed Development will have minimal impact, and as such a Traffic Impact Assessment is not deemed necessary.
Applicant: McCarthy & Woulfe Ltd. Reference: 21142	Construction of a single storey house and ancillary site works.	Decision: Grant Permission (with Conditions) Date: 02/06/2021	Exclude: Single dwelling house will have minimal impact on surrounding road network.

Application details	Description	Decision & Date	Include/Exclude in TTA
Location: Brook Place, Rhebogue, Limerick			
Applicant: Osprey Construction Limited Reference: 201074 Location: Brú na Gruadán, Castletroy, Co. Limerick	A residential development comprising 63 no. residential units.	Decision: Grant Permission (with Revised Conditions) Date: 06/05/2021	Exclude: The development will have a minor impact on Groody Road. It will have minimal impact compared with the normal traffic growth impact in the area covered by this TTA.
Applicant: McCarthy & Woulfe Ltd. Reference: 20827 Location: Anglers Walk, Rhebogue, Limerick	Construction of two no. dwelling houses and ancillary site works on an existing serviced road.	Decision: Grant Permission (with Conditions) Date: 23/07/2021	Exclude: 2 no. dwelling houses will have minimal impact on surrounding road network.
Applicant: Sharon Ryan Reference: 21823 Location: Castletroy View Childers Road, Co. Limerick	Removal of existing porch and construction of a new porch and bay window extension to the front of dwelling with lean-to roof over and removal of existing domestic store at the side of the dwelling and construction of an extension at the side and rear of dwelling and all associated site work	Decision: Grant Permission (with Conditions) Date: 03/08/2021	Exclude: Single dwelling house will have minimal impact on surrounding road network.
Applicant: McCarthy & Woulfe Ltd. Reference: 211395 Location: Rhebogue Road, Rhebogue, Limerick	Construction of a residential development comprising 6 no. terrace units with site entrance.	Decision: Grant Permission (with Conditions) Date: 17/05/2022	Exclude: 6 no. dwelling houses will have minimal impact on surrounding road network.
Applicant: Granville Rangers AFC Reference: 2223 Location: Granville Rangers AFC, Glenbrook, Bloodmill Road, Singland, Limerick.	The installation of an all-weather training pitch with a 3.0-metre-high surrounding fence and floodlighting on masts with ancillary site works.	Decision: Grant Permission (with Conditions) Date: 20/09/2022	Exclude: No additional traffic generated due to nature of development.
Applicant: Kearock Investments Ltd. Reference: 221216 Location: Old Dublin Road, Rhebogue, Limerick City	Large-Scale Residential Development (LRD) on lands (0.53 Ha) at Old Dublin Road, Rhebogue, Limerick City. The Proposed Development comprises of the construction of a Purpose-Built Student Accommodation (PBSA) scheme consisting of 26 no. apartments with a total of 202 no. student bedspaces.	Decision: Grant Permission (with Conditions) Date: 17/01/2023	Exclude: Traffic Assessment Report included as part of the planning submission stated that the Proposed Development will have minimal impact on traffic flows on the local road network due to low parking provision.

Application details	Description	Decision & Date	Include/Exclude in TTA
Applicant: John Conroy Reference: 23240 Location: Groody Toll House, Old Dublin Road, Singland, Limerick	Renovation of the protected structure No. 1628, known as the 'Groody' Toll House and the construction of a new extension. Connect to public services and carry out all ancillary site works at the above address. Previous permission granted under Planning Ref. No.18/774	Decision: Grant Permission (with Conditions) Date: 05/05/2023	Exclude: No additional traffic generated due to nature of development.
Applicant: Aldi Stores(Ireland) Limited Reference: 23205 Location: Aldi, Dublin Road, Limerick, Co. Limerick	The development will consist of the construction of a single store Deposit Return Scheme(DRS) Kiosk (Gross Floor Area: 17 sq. m), including 2 no. signage panel areas for branding on the side elevation of the DRS Kiosk (1.0m x 2.0m), and all associated site development works. The development will result in the removal of 3 no. existing car parking spaces in the car park that serves the existing Aldi store	Decision: Grant Permission (with Conditions) Date: 06/06/2023	Exclude: The development will have a minor impact on Groody Road. It will have minimal impact compared with the normal traffic growth impact in the area covered by this TTA.
Applicant: Aileen & John McCarthy Reference: 221208 Location: Rhebogue Meadows, Dublin Road, Limerick	Construction of a new detached dwelling house with connection to existing services and all ancillary site works	Decision: Grant Permission (with Conditions) Date: 21/08/2023	Exclude: Single dwelling house will have minimal impact on surrounding road network.
Applicant: Targeted Investment Opportunities ICAV Reference: 2360940 Location: Unit 3, Parkway Retail Park, Dublin Road, Co. Limerick, V94 TX68	The development that will consist of a proposed mezzanine level to provide for additional trading floorspace, proposed internal alterations to facilitate the development, proposed new signages to the front elevation, and all associated site works necessary to facilitate the development	Decision: Grant Permission (with Conditions) Date: 15/02/2024	Exclude: The development will have a minor impact on Groody Road. It will have minimal impact compared with the normal traffic growth impact in the area covered by this TTA.
Applicant: Limerick City and County Council Reference: JP91.317686 Location: Ballysimon, Co. Limerick	Proposed Development of the Bloodmill Road Extension Scheme.	Decision: Grant Permission (with Conditions) Date: 22/02/2024	Exclude: Road extension scheme will have positive impact on traffic flows.
Applicant: Louise Ryan Reference: 2438 Location: Villa Nova, Dublin Road, Limerick, V94YOET	The demolition & removal of front wall, associated groundworks, internal surface water system and creation of off-road parking	Decision: Grant Permission (with Conditions) Date: 02/05/2024	Exclude: Single dwelling house will have minimal impact on surrounding road network.
Applicant: Singland Leasing Ltd. Reference: 24232 Location: Dublin Road, Castletroy, Co. Limerick	The installation of a cold store to the south side of the petrol station and all ancillary site works	Decision: Grant Permission (with Conditions) Date: 02/05/2024	Exclude: No additional traffic generated due to nature of development.

Application details	Description	Decision & Date	Include/Exclude in TTA
Applicant: Dermot Coffey Reference: 23605 Location: Bloodmill Road, and Oakwood, Singland, Limerick	Construction of 7 no. two storey, 3-bedroom, terraced dwelling houses, all with off street car parking.	Decision: Grant Permission (with Conditions) Date: 23/10/2024	Exclude: 7 no. dwelling houses will have minimal impact on surrounding road network.
Applicant: Silvergrove Developments Limited Reference: 2460713 Location: Rhebogue Road, Drominbeg Road, Rhebogue, Limerick City.	Provision of 25 No. apartments in a two and three-storey height block on a site of 0.243 hectare.	Decision: Grant Permission (with Conditions) Date: Due 06/11/2024	Exclude: The TTA included as part of the planning submission stated that with the minimal provision of 17 no. car parking spaces, the Proposed Development will generate negligible traffic flows in the order of less than 10 no. private car trips during peak hours and will therefore have a near zero (negligible) impact on the local road network.
Applicant: Board of Management of St. Brigid's National School Reference: 2460575 Location: St. Brigid's National School, Singland, Limerick City, Limerick.	Construction of a new two-storey school building extension of 622.3m ² at the ground floor and 613.3m ² at the first floor, together with a single storey link connecting to the existing building.	Decision: Grant Permission (with Conditions) Date: 07/11/2024	Exclude: Will have minimal impact on traffic flows due to emphasis on public transport use.
Applicant: Cathal Glynn Reference: 2460178 Location: Groody Student Park, Castletroy, Co. Limerick	Construction of 6 No. student accommodation, duplex type units over three floors.	Decision: Grant Permission (with Revised Conditions) Date: 02/04/2025	Exclude: 6 no. duplex units will have minimal impact on surrounding road network.
Applicant: Groody Developments Limited Reference: 2560113 Location: Groody Road, Newcastle, Castletroy, Limerick	A Large-Scale Residential Development (LRD) - development of a Purpose-Built Student Accommodation (PBSA) scheme on land fronting the Groody Road and Dublin Road.	Decision: Grant Permission (with Conditions) Date: 25/09/2025	Exclude: The TTA included as part of the planning submission stated that with the minimal provision of 32 no. car parking spaces, the Proposed Development will generate negligible traffic flows in the order of less than 10 no. private car trips during peak hours and will therefore have a near zero (negligible) impact on the local road network.

Application details	Description	Decision & Date	Include/Exclude in TTA
Applicant: Ann Hannan Reference: 2560151 Location: Sandybrook House, Bloodmill Road, Limerick	A residential development comprising 31 no. residential units.	Decision: Grant Permission (with Conditions) Date: 23/10/2025	Exclude: The TTA included as part of the planning submission stated that with the minimal provision of 32 no. car parking spaces, the Proposed Development will generate negligible traffic flows in the order of less than 10 no. private car trips during peak hours and will therefore have a near zero (negligible) impact on the local road network.
Applicant: The Estate of the late Dermot Coffey Reference: 25220 Location: Oakwood, Singland, Limerick.	1 no. two storey 3 bedroom detached dwelling house with off street car parking, connection to main sewer and associated site works	Decision: Grant Permission (with Conditions) Date: 25/02/2026	Exclude: Single dwelling house will have minimal impact on surrounding road network.

In assessing the traffic impacts of the Proposed Development, consideration was also given to the overall Masterplan for the remaining zoned area of the subject site.

In addition to the residential apartments, creche and medical centre included in this Proposed Development, the Masterplan provides for two potential options for the future building out of the remainder of the site.

- ▶ The first option, based on the current provisions of Objective PV01 of the Limerick Development Plan 2022 - 2028, provides for primarily employment and commercial uses on the remainder of the masterplan site, with the following mixed-uses proposed:
 - A Hotel
 - 3 no. Office Buildings
 - A Life Sciences Building
- ▶ The second option, based on the revised Objective PV01 proposed under Proposed Variation No. 3 of the Limerick Development Plan 2022 - 2028, provides for primarily residential use on the remainder of the masterplan site as follows:
 - 500 Residential Units
 - A Hotel

Table 13-8. Estimated AM and PM peak hour traffic (PCUs) generated by Option 1 of the Masterplan with Primarily Employment / Commercial Further Development using TRICS

Land Use	Calculation Factor		Trip rate				Additional Number of Trips			
			AM Peak		PM Peak		AM Peak		PM Peak	
	No. of Units	GFA (m2)	Arrive	Depart	Arrive	Depart	Arrive	Depart	Arrive	Depart
Proposed Development							42	80	70	54
Masterplan - Offices		23,736	0.839	0.100	0.080	0.850	199	24	19	202
Masterplan - Hotel		6,326	0.313	0.272	0.286	0.256	20	17	18	16
Total							261	121	107	272

Table 13-9. Estimated AM and PM peak hour traffic (PCUs) generated by Option 2 of the Masterplan with Primarily Employment / Commercial Further Development using TRICS

Land Use	Calculation Factor		Trip rate				Additional Number of Trips			
			AM Peak		PM Peak		AM Peak		PM Peak	
	No. of Units	GFA (m2)	Arrive	Depart	Arrive	Depart	Arrive	Depart	Arrive	Depart
Proposed Development							42	80	70	54
Residential Units	500		0.048	0.138	0.116	0.067	26	76	64	37
Masterplan - Hotel		6,326	0.313	0.272	0.286	0.256	20	17	18	16
Total							88	173	152	107

From a traffic volume perspective, office developments are generally associated with higher traffic generation and more pronounced peak-hour movements due to commuter travel patterns, whereas residential developments typically result in lower overall trip volumes with trips distributed more evenly throughout the day. As a result, the estimated overall masterplan peaks presented in Table 13-8 for Option 1 above portrays the worst-case scenario.

The traffic modelling examines the worst-case peak hourly scenarios for both the AM and PM weekday peak periods for the Proposed Development. However, supplementary modelling has also been conducted to account for the additional Masterplan elements. Refer to Table 13-10 for comparison of Masterplan results which is minor in accumulation with the Proposed Development.

Table 13-10. Summary Results of all Surrounding Junctions with Masterplan Assessment

Number	Route	2043 Without Development RFC/DOS	2043 With Development RFC/DOS	2043 With Development & Masterplan RFC/DOS
1	Parkway Roundabout	115%	117%	119%
2	Dublin Road/Parkway Retail Park (Signal-Controlled)	67%	88%	99.6%
3	Parkway Retail Park Roundabout	30%	30%	32%

Number	Route	2043 Without Development RFC/DOS	2043 With Development RFC/DOS	2043 With Development & Masterplan RFC/DOS
4	Groody Roundabout	113%	116%	116%

13.10 References

- ▶ TII's Traffic and Transport Guidelines PE-PDV-02045 (May 2014)
- ▶ TII Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections (PE-PAG-02017 October 2021)
- ▶ Design Manual for Urban Roads & Streets (DMURS).
- ▶ Limerick Development Plan (2022-2028)
- ▶ Cycle Design Manual (September 2023)

RECEIVED: 28/05/2026



RECEIVED: 28/05/2026

Chapter 14 – Material Assets – Waste Management

TABLE OF CONTENTS

14. MATERIAL ASSETS – WASTE MANAGEMENT	14-1
14.1 Introduction.....	14-1
14.2 Methodology	14-1
14.2.1 Legislation and Guidance	14-2
14.2.2 Forecasting Methods and Difficulties Encountered	14-4
14.3 Receiving Environment	14-5
14.4 Characteristics of the Proposed Development.....	14-6
14.4.1 Demolition.....	14-6
14.4.2 Construction Phase	14-6
14.4.3 Operational Phase	14-7
14.5 Potential Impacts of the Proposed Development	14-8
14.5.1 Construction Phase	14-8
14.5.2 Operational Phase.....	14-9
14.6 Mitigation Measures.....	14-9
14.6.1 Construction Phase	14-10
14.6.2 Operational Phase	14-11
14.7 Monitoring or Reinstatement Measures	14-13
14.7.1 Construction Phase	14-13
14.7.2 Operational Phase.....	14-13
14.8 Residual Effects of the Proposed Development	14-14
14.8.1 Construction Phase	14-14
14.8.2 Operational Phase	14-14
14.9 Cumulative Impacts of the Proposed Development	14-15
14.9.1 Construction Phase	14-15
14.9.2 Operational Phase.....	14-15
14.10 References.....	14-16

LIST OF TABLES

Table 14.1 Predicted on and off-site reuse, recycle and disposal rates for construction waste	14-7
Table 14.2 Estimated Waste Generation for Residential Blocks A-C	14-8
Table 14.3 Estimated Waste Generation for Residential Blocks D, E, Creche and Medical	14-8
Table 14.4 Monitoring Proposals Construction Phase	14-13
Table 14.5 Monitoring Proposals Operational Phase	14-14

LIST OF FIGURES

Figure 14-1 Waste Hierarchy (Source: European Commission, 2018).	14-2
Figure 14-2 Circular Economy (Source: Repak, 2021).	14-3

RECEIVED: 28/05/2026

14. MATERIAL ASSETS – WASTE MANAGEMENT

14.1 Introduction

This chapter evaluates the likely impacts, if any, which the Proposed Development may have on Material Assets (related to waste management) as defined in the EIA Directive (Directive 2011/92/EU as amended by Directive 2014/52/EU) and the Environmental Protection Agency (EPA) *Guidelines on the information to be contained in Environmental Impact Assessment Reports* (2022).

It addresses issues associated with material assets (waste management) during the construction and operational phases of the Proposed Development as described in Chapter 2 (Description of the Proposed Development).

A site-specific Resource Waste Management Plan (RWMP) has been prepared by AWN Consulting to guide and manage the waste generated during the construction phase of the Proposed Development (including excavation works) and has been included as Appendix 14.1. The RWMP was prepared in accordance with the Environmental Protection Agency's (EPA) document *Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects* (2021).

A separate Operational Waste Management Plan (OWMP) has been prepared by AWN Consulting for the operational phase of the Proposed Development and is included as Appendix 14.2 of this Chapter.

This Chapter has been prepared in accordance with European Commissions Guidelines, Guidance on the preparation of the Environmental Impact Assessment Report (2017), and the EPA *Guidelines on the information to be contained in Environmental Impact Assessment Reports* (2022).

These documents will ensure the management of wastes arising at the development site in accordance with legislative requirements and best practice standards.

14.2 Methodology

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.

This Chapter is based on the Proposed Development, as described in Chapter 2 (Project Description) and considers the following aspects:

- ▶ Legislative context;
- ▶ Construction phase (including site excavation works); and
- ▶ Operational phase.

A desktop 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 and are included in Section 14.4 of this chapter. The waste types and estimated quantities are based on published data by the EPA in the National Waste Reports and National Waste Statistics, data recorded from similar previous developments, Irish and US EPA waste generation research, as well as other available research sources.

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. This information is presented in Section 14.6.

A detailed review of the existing ground conditions on a regional, local and site-specific scale is presented in Chapter 5 (Land & Soils). Chapter 5 also discusses the environmental quality of any soils which will have to be excavated to facilitate construction of the Proposed Development.

14.2.1 Legislation and Guidance

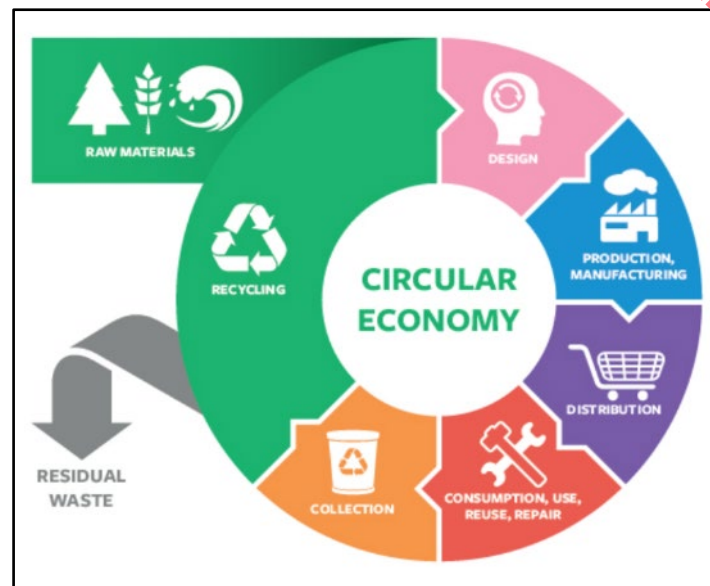
Waste management in Ireland is subject to EU, national and regional waste legislation and control, which defines how waste materials must be managed, transported and treated. The overarching EU legislation is the Waste Framework Directive (2008/98/EC) which is transposed into national legislation in Ireland. The cornerstone of Irish waste legislation is the Waste Management Act 1996 (as amended). European and national waste management policy is based on the concept of 'waste hierarchy', which sets out an order of preference for managing waste (prevention > preparing for reuse > recycling > recovery > disposal) (Figure 14-1).

Figure 14-1 Waste Hierarchy (Source: European Commission, 2018).



EU and Irish National waste policy also aims to contribute to the circular economy by extracting high-quality resources from waste as much as possible. Circular Economy (CE) is a sustainable alternative to the traditional linear (take-make-dispose) economic model, reducing waste to a minimum by reusing, repairing, refurbishing and recycling existing materials and products (Figure 14-2).

Figure 14-2 Circular Economy (Source: Repak, 2021).



The Irish government issues policy documents which outline measures 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, *Waste Action Plan for a Circular Economy (WAPCE) – Waste Management Policy in Ireland*, was published in 2020 and shifts focus away from waste disposal and moves it back up the production chain. The move away from targeting national waste targets is due to the Irish and international waste context changing in the years since the launch of the previous waste management plan, *A Resource Opportunity*, in 2012.

One of the first actions to be taken from the WAPCE was the development of the *Whole of Government Circular Economy Strategy 2022-2023 'Living More, using Less' (2021)* to set a course for Ireland to transition across all sectors and at all levels of Government toward circularity and was issued in December 2021.

The *Circular Economy and Miscellaneous Provisions Act 2022* was signed into law in July 2022. The Act underpins Ireland's shift from a "take-make-waste" linear model to a more sustainable pattern of production and consumption, that retains the value of resources in our economy for as long as possible and that will work to significantly reduce our greenhouse gas emissions. The Act defines Circular Economy for the first time in Irish law, incentivises the use of recycled and reusable alternatives to wasteful, single-use disposable packaging, introduces a mandatory segregation and incentivised charging regime for commercial waste, streamlines the national processes for End-of-Waste and By-Products decisions.

The strategy for the management of waste from the construction phase is in line with the requirements of the EPA's '*Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects*' (2021). The following guidance document was also consulted in the preparation of this assessment:

- Construction and Demolition Waste Management: A Handbook for Contractors and Site Managers (FÁS & Construction Industry Federation, 2002).

There are currently no Irish guidelines on the assessment of operational waste generation, and guidance is taken from industry guidelines, plans and reports including:

- The National Waste Management Plan for a Circular Economy 2024 - 2030 (NWMPC) (2024);
- BS 5906:2005 Waste Management in Buildings – Code of Practice;

- ▶ City and County of Limerick (Segregation, Storage and Presentation of Household and Commercial Waste) Bye-Laws (2019);
- ▶ The EPA National Waste Database Reports 1998 – 2020;
- ▶ The Circular Economy and National Waste Database Report 2021-2023 (2025); and
- ▶ EPA National Waste Statistics Web Resource

14.2.1.1 Terminology

Note that the terminology used herein is consistent with the definitions set out in Article 3 of the Waste Framework Directive. Key terms are defined as follows:

Waste - Any substance or object which the holder discards or intends or is required to discard.

Prevention - Measures taken before a substance, material or product has become waste, that reduce:

- ▶ a) the quantity of waste, including through the re-use of products or the extension of the life span of products;
- ▶ b) the adverse impacts of the generated waste on the environment and human health; or
- ▶ c) the content of harmful substances in materials and products.

Reuse - Any operation by which products or components that are not waste are used again for the same purpose for which they were conceived.

Preparing for Reuse - Checking, cleaning or repairing recovery operations, by which products or components of products that have become waste are prepared so that they can be re-used without any other pre-processing.

Treatment - Recovery or disposal operations, including preparation prior to recovery or disposal.

Recovery - Any operation the principal result of which is waste serving a useful purpose by replacing other materials which would otherwise have been used to fulfil a particular function, or waste being prepared to fulfil that function, in the plant or in the wider economy. Annex II of the Waste Framework Directive sets out a non-exhaustive list of recovery operations.

Recycling - Any recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes. It includes the reprocessing of organic material but does not include energy recovery and the reprocessing into materials that are to be used as fuels or for backfilling operations.

Disposal - Any operation which is not recovery even where the operation has as a secondary consequence the reclamation of substances or energy. Annex I of the Waste Framework Directive sets out a non-exhaustive list of disposal operations.

14.2.2 Forecasting Methods and Difficulties Encountered

The assessment of waste generation at the Proposed Development has been carried out using standard forecasting methods informed by published guidance, including the *EPA Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction and Demolition Projects* (2021) and *BS 5906:2005 Waste Management in Buildings – Code of Practice*.

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 from the proposed works as the exact materials and quantities may be subject to some degree of change and variation during the construction process.

While it is possible to initially select a licensed waste facility for soil disposal, there is potential to encounter contaminated material or material with naturally occurring variations in minerals and chemicals that necessitates sending it to a different suitably licensed facility. The sampling and testing carried out in the Site Investigations (SI) process provides spot samples, and further testing is required during the excavation process, as the true condition of all excavated material cannot be ascertained with certainty until this is undertaken.

There are numerous licensed, permitted and registered waste facilities in the Limerick City and County Council Local Authority Area, Southern Region, and across Ireland and Northern Ireland. However, facility availability, capacity, and contractor service constraints may limit options at a given time. Facilities operate under annual intake limits, which means that committing to a single receiving facility for the duration of works is not feasible. In practice, contractors will utilise facilities with available capacity at the time of removal, prioritising recovery and recycling opportunities in line with the waste hierarchy.

The ultimate selection of waste contractors and waste facilities would be subject to appropriate selection criteria; proximity, competency, capacity and serviceability. The waste facilities selected will ultimately be selected to minimise the environmental impacts on the surrounding environment.

Where uncertainty existed, conservative assumptions were applied to ensure robustness of the forecast. These uncertainties are typical for projects at the planning stage.

14.3 Receiving Environment

In terms of waste management, the receiving environment is largely defined by Limerick City and County Council (LCCC) as the local authorities responsible for setting and administering waste management activities in the areas. This is governed by the requirements set out in the *NWMPCE 2024 – 2030* and the *Waste Action Plan for a Circular Economy – Waste Management Policy in Ireland*.

The waste management plans set out the following targets for waste management in the region:

- ▶ *Achieve a recycling rate of 55% of managed municipal waste by 2025; 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 Waste Management Planning Offices have issued a National Waste Management Plan for a Circular Economy 2024 - 2030 (NWMPCE) in March 2024, which supersedes the Southern Region Waste Management plan and the two other regional waste management plans. The NWMPCE does not however dissolve the three regional waste areas. The NWMPCE sets the ambition of the plan to have a 0% total waste growth per person over the life of the Plan with an emphasis on non-household wastes including waste from commercial activities and the construction and demolition sector.

The Limerick City and County Development Plan 2022 - 2028 set out the policies and objectives for the LCCC area which reflect those set out in the regional waste management plan and can be found in Appendix 14.1 and 14.2.

In terms of physical waste infrastructure, LCCC no longer operates municipal landfills. Waste generated in the region is managed through licensed, permitted, and registered facilities across Limerick and the wider southern region, soil recovery sites, inert C&D waste facilities, municipal recovery facilities, transfer stations and material recovery facilities. Availability of these facilities varies depending on contractor selection, haul distance and real-time intake capacity.

However, these sites may not be available for use when required or may be limited by the waste contractor selected to service the development in the appropriate phase. In addition, there is potential for more

suitably placed waste facilities or recovery facilities to become operational in the future which will be more beneficial from an environmental perspective.

The ultimate selection of waste contractors and waste facilities would be subject to appropriate selection criteria proximity, competency, capacity and serviceability.

14.4 Characteristics of the Proposed Development

The Proposed Development comprises a large-scale residential development to provide 403 no. residential units over 5 no. apartment blocks ranging from 5 to 8 storeys in height; a medical centre located at the western edge of the site; a creche located at ground level within Block B; and all associated site works and development.

A full description is included in Chapter 2 (Description of the Development) of this EIAR and in the statutory notices.

The characteristics of the Proposed Development that are relevant in terms of waste management are summarised below.

14.4.1 Demolition

There will be waste materials generated from the demolition of part of the existing concrete slab and hard standing areas on site. The project engineers, Punch Consulting Engineers, have advised that this will amount to c. 40 m³ of concrete.

14.4.2 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, cladding, plastics etc. Waste from packaging (cardboard, plastic, timber) and oversupply of materials may also be generated.

In general excavations will be limited as existing site levels will need to be raised using imported fill to achieve floor levels for Blocks A to D. Excavations will however be required to facilitate the floor levels for Block E, for road development, installation of services and landscaping purposes. In addition, localised excavations will be required to facilitate pile installation. It has been estimated by the quantity surveyors for the project, Mitchell Mc Dermott, that c. 41,275 m³ of made ground and subsoil will need to be excavated to facilitate construction. There are limited opportunities for reuse of excavated material on site, and it is currently envisaged that around 10% of this, c. 4,127.5 m³ will be able to be retained and reused onsite for landscaping and fill.

The remainder, c. 37,147.5 m³ will need to be removed off site by a licensed contractor and will be taken for appropriate reuse, recycling or disposal. In the case that any excavated soil is tested and deemed contaminated and unfit for reuse on-site, it will need to be removed offsite. This will be taken for appropriate offsite reuse, recovery, recycling and / or disposal.

When material that requires removal from the site is deemed to be a waste, removal and reuse / recycling / recovery / disposal of the material will be carried out in accordance with the Waste Management Act 1996 (as amended), the Waste Management (Collection Permit) Regulations 2007 (as amended) and the Waste Management (Facility Permit & Registration) Regulations 2007 (as amended). The volume of waste requiring recovery / disposal will dictate whether a Certificate of Registration (COR), permit or licence is required for the receiving facility. Alternatively, the material may be classed as by-product under Regulation 27 (By-products), as amended, of S.I. No. 323/2020 - European Union (Waste Directive) Regulations 2011-2020, (Previously Article 27 of the European Communities (Waste Directive)). For more information in relation to the envisaged management of by-products, refer to the RWMP (Appendix 14.1).

In order to establish the appropriate reuse, recovery and / or disposal route for the soils and stones 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 (2019). Environmental soil analysis will be carried out prior to removal of the material 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. Any surplus excavated material will be suitable for acceptance at either inert or non-hazardous soil recovery facilities / landfills in Ireland or, in the unlikely event of hazardous material being encountered, be transported for treatment / recovery or exported abroad for disposal in suitable facilities.

Waste will also be generated from construction phase 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 on-site during the Construction phase. Waste printer / toner cartridges, waste electrical and electronic equipment (WEEE) and waste batteries may also be generated in small volumes from site offices.

Further detail on the waste materials likely to be generated during the excavation and construction works are presented in the project-specific RWMP (Appendix 14.1). The RWMP provides an estimate of the main waste types likely to be generated during the Construction phase of the Proposed Development. These are summarised in Table 14.1, below.

Table 14.1 Predicted on and off-site reuse, recycle and disposal rates for construction waste

Waste Type	Tonnes	Reuse		Recycle / Recovery		Disposal	
		%	Tonnes	%	Tonnes	%	Tonnes
Mixed C&D	730	10	73	80	584	10	73
Timber	620	40	248	55	341	5	31
Plasterboard	221	30	66	60	133	10	22
Metals	177	5	9	90	159	5	9
Concrete	66	30	20	65	43	5	3
Other	332	20	66	60	199	20	66
Total	2146		482		1459		205

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 from the construction of the Proposed Development as the exact materials and quantities may be subject to some degree of change and variation during the construction process. However, the above estimates are considered to be the worst-case scenario.

14.4.3 Operational Phase

Waste will be generated from the residential units, medical centre, and the creche unit. All waste materials will be segregated into appropriate categories and will be stored in appropriate bins in designated waste storage areas (WSAs), in easily accessible areas of the site.

The total estimated waste generation for the Proposed Development for the main waste types, based on the AWN waste generation model (WGM) incorporating EPA National Waste reports data, EPA National Waste Statistics Web Resource, predicted occupancy of the units and floor use per m² of the Proposed Development, is presented in Table 14.2 and Table 14.3, below, and is based on the uses and areas as advised by the project architect. Further break down of the estimated waste generation during the operational phase for each of the residential units can be found in the OWMP (Appendix 14.2).

Table 14.2 Estimated Waste Generation for Residential Blocks A-C

Waste Type	Waste Volume (m ³ / week)		
	Block A	Block B	Block C
Organic Waste	1.07	1.27	1.21
Dry Mixed Recyclables	7.60	8.98	8.57
Glass	0.21	0.25	0.23
Mixed Non-Recyclables	3.99	4.72	4.51
Total	12.87	15.21	14.53

Table 14.3 Estimated Waste Generation for Residential Blocks D, E, Creche and Medical

Waste Type	Waste Volume (m ³ / week)			
	Block D	Block E	Creche	Medical Centre
Organic Waste	1.14	0.86	0.03	0.07
Dry Mixed Recyclables	8.08	6.08	1.06	1.60
Glass	0.22	0.17	0.00	0.01
Mixed Non-Recyclables	4.25	3.20	0.58	0.69
Medical Waste	-	-	-	0.50
Confidential Paper	-	-	-	0.16
Total	13.70	10.30	1.67	3.40

The residents, medical centre staff, and creche unit staff will be required to provide and maintain appropriate waste receptacles within their units to facilitate segregation at source of these waste types. As required, the residents and creche unit/medical centre tenants will need to bring these segregated wastes from their units to their respective Waste Storage Areas (WSAs). All WSA's can be viewed on the plans submitted with the application and in the OWMP (Appendix 14.2 of this Chapter).

The OWMP seeks to ensure the development contributes to the targets outlined in the NWMPC and the LCCC Waste By-laws.

14.5 Potential Impacts of the Proposed Development

14.5.1 Construction Phase

The impact assessment in this section relates to all phases of construction including demolition of parts of the concrete slab and site excavation works.

The Proposed Development will generate a range of non-hazardous and hazardous waste materials during demolition, site excavation 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. If waste material is not managed and stored correctly, it is likely to lead to litter or pollution issues at the development site and in adjacent areas. The indirect effect of litter issues is the presence of vermin in areas affected. In the absence of mitigation, the effect on the local and regional environment is likely to be *indirect, short-term, significant and negative*.

The use of non-permitted waste contractors or unauthorised waste facilities could give rise to inappropriate management of waste, resulting in indirect negative environmental impacts, including 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. In the absence of mitigation, the effect on the local and regional environment is likely to be ***indirect, long-term, significant and negative***.

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, and acceptance of waste from the development site 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 arisings at facilities in the region. The majority of construction materials are either recyclable or recoverable. However, in the absence of mitigation, the effect on the local and regional environment is likely to be ***indirect, short-term, significant and negative***.

There is a quantity of material which will need to be demolished and excavated to facilitate the Proposed Development. A detailed review of the existing ground conditions on a regional, local site-specific scale is presented in Chapter 5 (Land and Soils). It is anticipated that c. 4,127 m³ will be reused on site and c. 37,147.5 m³ (in addition to c. 40 m³ of concrete from demolitions) will need to be removed off site by a licensed contractor and will be taken for appropriate reuse, recycling or disposal. In the event that excavated material is found to be contaminated it will need to be removed off-site. 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. However, in the absence of mitigation, the effect on the local and regional environment is likely to be ***indirect, short-term, significant and negative***.

14.5.2 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 which would lead to small volumes of waste being sent unnecessarily to landfill. In the absence of mitigation, the effect on the local and regional environment is likely to be ***indirect, long-term, moderate and negative***.

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).

If waste material is not managed and stored correctly, it is likely to lead to litter or pollution issues at the development site and in adjacent areas. The knock-on effect of litter issues is the presence of vermin in affected areas. However, in the absence of mitigation, the effect on the local and regional environment is likely to be ***indirect, short-term, moderate and negative***.

Waste contractors will be required to service the Proposed 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, and that time and resources are dedicated to ensuring efficient waste management practices. However, in the absence of mitigation, the effect on the local and regional environment is likely to be ***indirect, long-term, significant and negative***.

14.6 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.

The concept of the 'Waste Hierarchy' and 'Circular Economy' is employed when considering all mitigation measures. The waste hierarchy states that the preferred option for waste management is prevention and minimisation of waste, followed by preparing for reuse and recycling / recovery, energy recovery (i.e. incineration) and, least favoured of all, disposal. The circular economy principle aims to keep materials, components, and products in-use in the economy for as long as possible. In circularity, the key objective is to design consumption and production systems to create and retain value. Both principles have been applied and will further be applied during the detailed design, construction and operational phases.

The waste management objectives for the Proposed Development are as follows. These measures will facilitate material reuse and recycling, where possible, and seek to divert waste from landfill:

- ▶ **Prevention (Construction Phase):** The main Contractor will prevent and minimise waste generation where possible by ensuring large surpluses of construction materials are not delivered to the site through coordination with the suppliers, operating a 'just-in-time' delivery scheme and ensuring sub-contractors conform to the Contractor(s) RWMP. The RWMP submitted with this application outlines the overarching principles, and a more detailed, site-specific version will be prepared by the Main Contractor prior to the commencement of the works. Prevention measures will also include careful planning of excavations to maximise the reuse of excavated materials on-site and minimise surplus volumes requiring off-site management;
- ▶ **Reuse (Construction and Operational Phases):** Reuse of waste and surplus materials including the reuse of suitable excavated soil and stone as fill material to facilitate construction, and associated works, where appropriate. Surplus construction materials will be repurposed on-site where feasible. During the operational phase, reuse will be encouraged through appropriate segregation of waste streams to support recovery and minimise disposal;
- ▶ **Recycle (Construction and Operational Phases):** Recycling will be implemented during construction with segregated skips or containers provided for recyclable C&D waste streams such as metals, timber, plastic and cardboard. During the operational phase, designated waste storage areas will be provided in easily accessible areas of the site to facilitate segregation of waste at source; and
- ▶ **Disposal (Construction and Operational Phases):** Where waste disposal is unavoidable, it will be carried out in accordance with the Waste Management Act 1996 (as amended) and relevant guidance. This applies to both construction waste and operational waste streams. Only licensed / permitted waste contractors will be used, and waste will be sent to authorised facilities. Disposal will remain a last resort in line with waste hierarchy principles.

14.6.1 Construction Phase

The primary waste management objective during construction will be to prevent waste from arising in the first place and to reuse, recycle or recover waste materials, where possible.

As previously stated, a project specific Resource and Waste Management Plan (RWMP) has been prepared in line with the requirements of the EPA Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects' (2021) and is included as Appendix 14.1. The mitigation measures outlined in the RWMP will be implemented in full and form part of mitigation strategy for the site. The mitigation measures presented in the RWMP will ensure effective waste management and minimisation, reuse, recycling, recovery and disposal of waste material generated during the demolition, excavation and construction phases of the Proposed Development.

The following mitigation measures will be implemented during the construction phase of the Proposed Development:

- ▶ Prior to commencement, the appointed Contractor(s) will be required to refine / update the RWMP (Appendix 14.1) in agreement with LCCC and in compliance with any planning conditions, or submit an addendum to the RWMP to LCCC, detailing specific measures to minimise waste generation and

resource consumption, and provide details of the proposed waste contractors, hauliers and destinations of each waste stream.

- ▶ The Contractor will implement the RWMP throughout the duration of the proposed demolition, excavation and construction phases and should treat the document as outlined in the guidance as a live document.
- ▶ A quantity of topsoil and sub soil will need to be excavated to facilitate the Proposed Development. The project design team have anticipated that c. 4,127 m³ will be reused on site and c. 37,147.5 m³ will need to be removed off site by a licensed contractor and will be taken for appropriate reuse, recycling or disposal. In the event that any excavated soil is found to be contaminated it will need to be removed off-site. 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.
- ▶ Building materials will be chosen to 'design out waste', in line with circular economy principles and green procurement strategies outlined in the RWMP. Product selection will, where practicable, favour materials with recycled content and take-back schemes.
- ▶ On-site segregation of waste materials will be carried out where possible to increase opportunities for off-site reuse, recycling and recovery. The following waste types, at a minimum, will be segregated:
 - Concrete rubble (including ceramics, tiles and bricks);
 - Plasterboard;
 - Metals; 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 Resource Manager (RM) will be appointed by the main Contractor(s) to ensure effective management of waste during the excavation and construction works.
- ▶ All construction staff will receive training in site-specific waste management procedures as part of the induction process.
- ▶ 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 suitably permitted contractors and taken to suitably registered, permitted or licenced facilities.
- ▶ All waste leaving the site will be recorded and copies of relevant documentation maintained.
- ▶ Nearby sites requiring clean fill material will be contacted to investigate reuse opportunities for clean and inert material, if required. If any of the material is to be reused on another site as by-product (and not as a waste), this will be done in accordance with Regulation 27 of the *EC (Waste Directive) Regulations (2011-2020)*. EPA approval will be obtained prior to moving material as a by-product.

These mitigation measures will ensure that the waste arising from the construction phase of the Proposed Development is dealt with in compliance with the provisions of the *Waste Management Act 1996, as amended*, associated Regulations and the *Litter Pollution Act 1997*, the *NWMPCE (2024)*. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved and will promote more sustainable consumption of resources.

14.6.2 Operational Phase

The primary waste management objective during the operational phase will be to ensure that all waste generated within the Proposed Development is managed in accordance with the *Waste Management Act 1996, as amended*, associated Regulations and the *Litter Pollution Act 1997* and the *NWMPCE*. Measures will focus on segregation, reuse, recycling, and recovery, with disposal as a last resort, in line with the waste hierarchy and circular economy principles.

The following mitigation measures will be implemented during the operational phase of the Proposed Development:

- ▶ All waste materials will be segregated into appropriate categories and will be temporarily stored in appropriate bins, skips or other suitable receptacles in the designated waste storage areas (WSAs), in easily accessible areas of the site.
- ▶ The facility management personnel and medical centre / creche tenants and will be responsible for ensuring – allocating personnel and resources, as needed – for the implementation of an Operational Waste Management Plan (OWMP), ensuring a high level of recycling, reuse and recovery at the site of the Proposed Development.
- ▶ The Staff/ Facilities Management will regularly audit the onsite waste storage facilities and infrastructure and maintain a full paper trail of waste documentation for all waste movements from the site.
- ▶ Healthcare Risk Waste generated in the medical centre will be managed in accordance with the strategy outlined in Section 5.3 of the OWMP (which is included as Appendix 14.2 of this Chapter) and with the relevant best practice guidance which include the following:
 - Health Service Executive (HSE), Waste Policy (2016)
 - Health Service Executive (HSE), Waste Management Awareness Handbook (2011)
 - HSE and Department of Health and Children (DOHC), Healthcare Risk Waste Management: Segregation, Packaging and Storage Guidelines for Healthcare Risk Waste, 4th Edition (2010)
 - Environmental Protection Agency (EPA) Green Healthcare, best practice guides for the reduction and segregation of hospital waste.
- ▶ The Residents/ Staff / Facilities Management will ensure on-Site segregation of all waste materials into appropriate categories, including (but not limited to):
 - Organic waste;
 - Dry Mixed Recyclables;
 - Mixed Non-Recyclable Waste;
 - Glass;
 - Cardboard;
 - Plastic;
 - Waste electrical and electronic equipment (WEEE) including computers, printers and other ICT equipment;
 - Cooking oil;
 - Cleaning chemicals (paints, adhesives, resins, detergents, etc.);
 - Furniture (and from time-to-time other bulky waste); and
 - Abandoned bicycles.
- ▶ Facilities management and medical centre / creche tenants will ensure that all waste materials will be stored in colour coded bins or other suitable receptacles in the allocated WSAs. Bins will be clearly identified with the approved waste type to ensure there is no cross contamination of waste materials.
- ▶ Facilities management and medical centre / creche tenants will ensure that all waste collected from the site of the Proposed Development will be reused, recycled or recovered, where possible, with the exception of those waste streams where appropriate facilities are currently not available.
- ▶ Facilities management and medical centre / creche tenants will ensure that all waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licensed facilities.

These mitigation measures will ensure the waste arising from the Proposed Development is dealt with in compliance with the provisions of the Waste Management Act 1996, as amended, associated Regulations, the Litter Pollution Act 1997, the NWMPCE (2024) and the LCCC waste bye-laws. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved.

14.7 Monitoring or Reinstatement Measures

14.7.1 Construction Phase

The management of waste during the construction phase will be monitored by the Contractor's appointed Resource Manager (RM) to ensure compliance with the above-listed mitigation measures, and relevant waste management legislation and local authority requirements, including maintenance of waste documentation. Monitoring proposals for the construction phase are summarised in Table 14.4.

Table 14.4 Monitoring Proposals Construction Phase

Likely Significant Effect	Monitoring Proposals
Litter Pollution	The Contractor will review and maintain waste records and site audits.
Unlicensed Waste Collection (Illegal Dumping)	A register will be maintained and reviewed. A copy of all waste collection permits will be maintained.
Insufficient Waste Facilities	A register will be maintained and reviewed. A copy of all waste collection permits will be maintained.
Lack of Waste Classification	An appointed RM will monitor all on-site waste segregation, volumes, and classification.

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 demolition, excavation and construction works, where there is a potential for waste management objectives to become secondary to other objectives, i.e. progress and meeting schedule targets. The mitigation measures set out in the RWMP specify the need for a Resource Manager to be appointed, who will have responsibility for monitoring the actual waste volumes being generated and ensuring that contractors and sub-contractors are segregating waste as required.

Where targets are not being met, the RM will identify the reasons for this and work to resolve any issues. Recording waste generation during the construction phase of the Proposed Development will enable better management of waste contractor requirements and support identification of trends or opportunities for improved resource efficiency. The data should be maintained to inform future developments.

14.7.2 Operational Phase

The management of waste during the operational phase will be monitored by the Facilities Management Company to ensure effective implementation of the mitigation measures outlined in Section 14.6 internally and by the nominated waste contractor(s). Monitoring proposals for the operational phase are summarised in Table 14.5.

Table 14.5 Monitoring Proposals Operational Phase

Likely Significant Effect	Monitoring Proposals
Litter Pollution	Waste storage areas will be monitored by the Facilities Management Company
Unlicensed Waste Collection (Illegal Dumping)	The Facilities Management Company will maintain waste receipts onsite for a period of 7 years and make available to LCCC as requested.
Poor Waste Segregation	Waste generation volumes and cross contamination will be monitored by the Facilities Management Company.

There may be opportunities to reduce the number of bins and equipment required in the WSAs, where estimates have been too conservative. Reductions in bin and equipment requirements will improve efficiency and reduce waste contactor costs.

14.8 Residual Effects of the Proposed Development

This section assesses potential significant environmental impacts which remain after mitigation measures are implemented.

The implementation of the mitigation measures outlined in Section 14.6 will ensure that targeted rates of reuse, recovery and recycling are achieved at the site of the Proposed Development during the construction and operational phases. 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.

14.8.1 Construction Phase

A carefully planned approach to waste management as set out in Section 14.6.1 and adherence to the RWMP (which includes mitigation) (Appendix 14.1) during the construction phase will promote resource efficiency and waste minimisation. When the mitigation measures are implemented and a high rate of prevention reuse, recycling and recovery is achieved, the predicted impact of the construction phase on the environment will be *short-term, imperceptible* and *neutral*.

14.8.2 Operational Phase

During the operational phase, a structured approach to waste management as set out in Section 14.6.2 and adherence to the OWMP (which includes mitigation) (Appendix 14.2) during the operational phase 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, imperceptible* and *neutral*.

14.9 Cumulative Impacts of the Proposed Development

14.9.1 Construction Phase

Developments that potentially could overlap during the construction phase are identified in Chapter 2 (Description of the Proposed Development). All cumulative developments outlined in Chapter 2 have been taken into account.

Other developments in the area will be required to manage waste in compliance with national and local legislation, policies and plans which will mitigate against any potential cumulative effects associated with waste generation and waste management. As such the effect will be ***short-term, not significant*** and ***neutral***.

14.9.2 Operational Phase

There are existing residential and commercial developments close by, along with the multiple permissions remaining in place. All of the current and potential developments will generate similar waste types during their operational phases. Authorised waste contractors will be required to collect waste materials segregated, at a minimum, into recyclables, organic waste and non-recyclables. An increased density of development in the area is likely to improve the efficiency of waste collections in the area.

Other developments in the area and the developments planned for the surrounding land will be required to manage waste in compliance with national and local legislation, policies and plans which will minimise/mitigate any potential cumulative impacts associated with waste generation and waste management. As such the effect will be a ***long-term, imperceptible*** and ***neutral***.

14.10 References

- ▶ Environmental Impact Assessment (EIA) Directive (2011/92/EU as amended by Directive 2014/52/EU)
- ▶ Environmental Protection Agency (EPA) 'Guidelines on the information to be contained in Environmental Impact Assessment Reports' (2022)
- ▶ Environmental Protection Agency (EPA) 'Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction and Demolition Projects (2021).
- ▶ European Commission, Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (2017).
- ▶ Waste Management Act 1996 (No. 10 of 1996), as amended.
- ▶ Department of Communications, Climate Action and Environment (DCCAE), Waste Action Plan for the Circular Economy - Ireland's National Waste Policy 2020-2025 (Sept 2020).
- ▶ DCCAE, Whole of Government Circular Economy Strategy 2022-2023 'Living More, Using Less' (2021)
- ▶ The Circular Economy and Miscellaneous Provisions Act 2022
- ▶ FÁS and the Construction Industry Federation (CIF), Construction and Demolition Waste Management – a handbook for Contractors and site Managers (2002).
- ▶ Regional Waste Management Planning Offices, National Waste Management Plan for a Circular Economy 2024 – 2030 (2024).
- ▶ BS 5906:2005 *Waste Management in Buildings* – Code of Practice;
- ▶ Limerick City and County Council (LCCC) City and County of Limerick (Segregation, Storage and Presentation of Household and Commercial Waste) Bye-Laws (2019).
- ▶ Environmental Protection Agency (EPA), National Waste Database Reports 1998 – 2020 and the Circular Economy and National Waste Database Report 2021 – 2023 (2025)
- ▶ Limerick City and County Council (LCCC), Limerick Development Plan 2022-2028 (2022)
- ▶ Environmental Protection Agency (EPA), Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous (2019)
- ▶ Council Decision 2003/33/EC, establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC.
- ▶ Litter Pollution Act 1997 (S.I. No. 12 of 1997) as amended.
- ▶ Protection of the Environment Act 2003, (No. 27 of 2003) as amended.
- ▶ Department of Environment and Local Government (DoELG) Waste Management – Changing Our Ways, A Policy Statement (1998).
- ▶ Forum for the Construction Industry – Recycling of Construction and Demolition Waste.
- ▶ Planning and Development Act 2000 (No. 30 of 2000) as amended
- ▶ US EPA, Characterisation of Building Uses (1998);
- ▶ EPA and Galway-Mayo Institute of Technology (GMIT), EPA Research Report 146 – A Review of Design and Construction Waste Management Practices in Selected Case Studies – Lessons Learned (2015)



RECEIVED: 28/05/2026

Chapter 15 – Material Assets – Utilities

TABLE OF CONTENTS

15. MATERIAL ASSETS – UTILITIES	15-2
15.1 Introduction.....	15-2
15.2 Methodology	15-2
15.2.1 Relevant Legislation and Guidance Notes.....	15-2
15.2.2 Sources of Information	15-3
15.2.3 Difficulties Encountered	15-3
15.3 Receiving Environment	15-4
15.3.1 Land Use, Property, and Access.....	15-4
15.4 Characteristics of the Proposed Development.....	15-8
15.4.1 Construction Phase	15-8
15.4.2 Operational Phase.....	15-12
15.4.3 Do Nothing Scenario.....	15-15
15.4.4 Decommissioning	15-15
15.5 Potential Impacts of the Proposed Development	15-15
15.5.1 Construction Phase	15-16
15.5.2 Operational Phase	15-17
15.6 Mitigation Measures.....	15-19
15.6.1 Construction Phase	15-19
15.6.2 Operational Phase.....	15-20
15.7 Monitoring Or Reinstatement Measures.....	15-20
15.8 Residual Effects Of The Proposed Development.....	15-20
15.8.1 Construction Phase	15-20
15.8.2 Operational Phase.....	15-20
15.9 Cumulative Impacts of the Proposed Development	15-20
15.9.1 Construction Phase	15-20
15.9.2 Operational Phase.....	15-21

LIST OF FIGURES

Figure 15-1 Aerial Views of the Existing Site (Source: Reddy A+U, May 2026)	15-4
Figure 15-2 Site Plan illustrating Application and Ownership Boundaries (Source: Reddy A+U, Drawing Ref. PVAL-02-SW-ZZ-DR-RAU-AR-1001 May 2026)	15-5
Figure 15-3 Site Layout Plan showing Proposed Site Access Locations (Source: Site Plan is Extract from Landscape Plan Drawing PAV-JBA-XX-XX-DR-L-0002, JBA, May 2026)	15-6
Figure 15-4 Construction Compound showing temporary connections to Surface Water, Foul and Water Supply Infrastructure (Source: Punch, CEMP, May 2026)	15-9

15. MATERIAL ASSETS – UTILITIES

15.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) evaluates the potential impacts that the Proposed Development may have on a range of Material Assets as defined in the EPA Guidelines 'Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, 2022).

The EPA Guidance (EPA, 2022) discuss material assets as follows: " In Directive 2011/92/EU this factor included architectural and archaeological heritage. Directive 2014/52/EU includes those heritage aspects as components of cultural heritage. Material assets can now be taken to mean built services and infrastructure. Traffic is included because in effect traffic consumes transport infrastructure. Sealing of agricultural land and effects on mining or quarrying potential come under the factors of land and soils."

The EPA Guidelines (EPA, 2022) specifically lists and provides sample headings and topics for material assets that include: Roads and Traffic, (Construction Phase, Operational Phase, Unplanned Events [i.e. Accidents]), Built Services (Electricity, Telecommunications, Gas, Water Supply Infrastructure, and Sewerage), Waste Management (Construction Waste, and Operational Waste).

The impact assessment presented in this chapter aims to identify potential impacts that have not been previously addressed in other sections of the EIA report.

The purpose of this chapter is to identify and evaluate any potential significant impacts that the Proposed Development may have on these utilities, such as damage to infrastructure or disruptions to essential services. By conducting this assessment, appropriate mitigation measures can be developed and implemented to minimise any negative impacts and ensure that the development project is carried out in an environmentally responsible manner.

15.2 Methodology

15.2.1 Relevant Legislation and Guidance Notes

The following legislation and guidance notes were referred to in preparing this impact assessment including:

- ▶ EPA Guidelines 2022; on the Information to be contained in Environmental Impact Assessment Reports;
- ▶ EPA Advice Notes for Preparing Environmental Impact Statements (Draft September 2015);
- ▶ European Communities Environmental Objectives (Surface Waters) Regulations 2009 (as amended);
- ▶ Waste Water Discharge (Authorisation) (EIA) Regulations 2016 (S.I. No. 652/2016);
- ▶ Electricity Regulation Act 1999 (Restricted Electrical Works) Regulations 2013;
- ▶ Health & Safety Authority (2016) Code of Practice for Avoiding Danger from Underground Services;
- ▶ Safety, Health and Welfare at Work Act 2005; and
- ▶ Safety, Health and Welfare at Work (Construction) Regulations 2013.

In this EIAR, the impacts on the material assets described in the above guidance have already been considered in the following chapters and therefore these aspects will not be addressed in specific detail within this chapter.

- ▶ Chapter 4 – Human Health and Population;
- ▶ Chapter 5 – Land, Soils and Geology;
- ▶ Chapter 6 – Hydrology and Hydrogeology;
- ▶ Chapter 8 – Air Quality;
- ▶ Chapter 9 – Climate;

- ▶ Chapter 10 – Noise and Vibration;
- ▶ Chapter 11 – Landscape and Visual Impact
- ▶ Chapter 12 – Archaeological, Architectural and Cultural Heritage;
- ▶ Chapter 13 – Material Assets - Traffic and Transportation; and
- ▶ Chapter 14 – Material Assets – Waste Management

This chapter assesses material assets major infrastructure and utilities which have not already been addressed elsewhere in this EIAR. The potential impacts, if any, are assessed in terms of the following:

- ▶ Land Use, Property, and Access.
- ▶ Power and Electrical Supply.
- ▶ Telecommunications.
- ▶ Surface water infrastructure.
- ▶ Foul drainage infrastructure; and
- ▶ Potable Water infrastructure.

15.2.2 Sources of Information

This chapter has been prepared having regard to the following documents, which accompany the planning application:

- ▶ A range of design site plans and drawings, as submitted with this planning application.
- ▶ Moloney Fox Consulting Engineers (May 2026), Utility Report which outlines electricity and telecommunications design information for the Proposed Development.
- ▶ Punch Consulting Engineers (May 2026), Engineering Planning Report which provides detailed water supply and drainage design information for the Proposed Development.
- ▶ Punch Consulting Engineers (May 2026), Traffic and Transportation Assessment (TTA)
- ▶ Punch Consulting Engineers (May 2026), Mobility Management Plan (MMP)
- ▶ Punch Consulting Engineers (May 2026), Construction Environmental Management Plan (CEMP)
- ▶ Punch Consulting Engineers (May 2026), Stage 2 Flood Risk Assessment.
- ▶ Moloney Fox Consulting Engineers (May 2026), Site Lighting Report which outlines the site lighting design intent and considerations to be taken with regards to the Proposed Development.
- ▶ Macro Works Ltd (April 2026), Glint and Glare Assessment which assesses the potential for solar reflectance effects upon aviation receptors in respect of proposed roof-mounted solar PV installations on the roofs of the residential buildings. Included as Appendix 15.1 of this EIAR chapter.

The assessment of impact on utilities is considered with respect to the availability and capacity within the utility network(s) and consultation with Uisce Éireann, ESB Networks and telecommunication companies (EIR and Enet).

15.2.3 Difficulties Encountered

Compiling the material assets (utilities) chapter of an EIAR can be a complex process, especially when it involves ongoing consultations between the design team and the various service providers like Uisce Éireann, ESB Networks, EIR and Enet.

It is difficult to predict the exact impact the construction phase will have on utilities until construction methodologies have been confirmed by the Main Contractor appointed.

The finalisation of agreements related to utilities may only be concluded at the connection agreement stage after planning permission has been granted. This introduces an additional layer of complexity, as the terms and conditions of these agreements may not be fully known until later stages of the project, potentially impacting the accuracy and completeness of the assessment.

15.3 Receiving Environment

15.3.1 Land Use, Property, and Access

15.3.1.1 Land Use and Property

The Proposed Development is to be located on a site known as 'Parkway Valley' on the Dublin Road (R445), Singland, Limerick, County Limerick. It is approximately 6.18 hectares in extent. The lands are bounded to the east by the Groody Valley Green Wedge and the suburb of Castletroy, to the north by the Dublin Road (R445), to the west by the Parkway Retail Park, and to the south and southwest by the Castletroy View and Carn Na Ree residential areas.

A review of early historical mapping records dated from 1829 to the early 20th century coupled with historical aerial imagery dated from 1995 to the present day indicated that the subject site was unoccupied by any building structures until 2007. A shopping centre, referred to as Horizon Mall, was partially constructed on the site in 2007 and was demolished in 2020, with reinforced concrete retaining walls left in situ. It is understood that much of the material from the demolition was used for backfilling and land raising purposes on the site such that the site is now predominately covered in made ground.

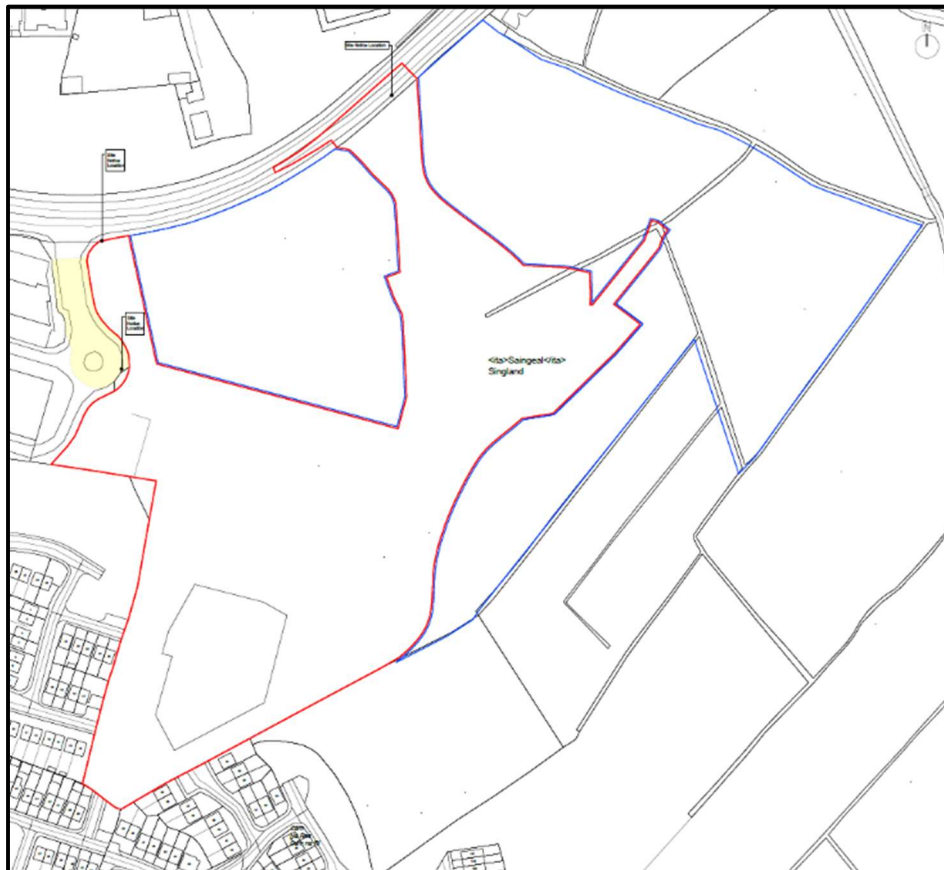
The subject site currently consists of a gravel footprint, buried concrete where the previous development was demolished in the centre, and some brownfield areas towards the southern and eastern boundaries which were likely reworked during the construction / demolition phase of the previous project. The ground level of the site is elevated above the Groody River floodplain to the east. The current site sits at elevations between 5 m and 17 m above ordnance datum (AOD) Malin, with majority of the site generally flat (between 8.4 m and 9.64 mAOD) and falling to the east. Figure 15-1 presents aerial views of the existing Site.

Figure 15-1 Aerial Views of the Existing Site (Source: Reddy A+U, May 2026)



The majority of the site is in the ownership of the Applicant, extending beyond the ownership boundary just onto the Dublin Road (R445) to facilitate establishing a new site access. Part of the neighbouring 'Groody Valley Green Wedge' zoned land to the east, is also in the ownership of the Applicant, a portion of which has been incorporated into the Proposed Development design to provide for connectivity between the development and the green wedge and also to provide for nature-based SuDS drainage proposals to serve the development. The area which is the subject of this application (red line boundary) and the land within the ownership of the Applicant (blue line boundary) are illustrated in Figure 15-2.

Figure 15-2 Site Plan illustrating Application and Ownership Boundaries (Source: Reddy A+U, Drawing Ref. PVAL-02-SW-ZZ-DR-RAU-AR-1001 May 2026)



15.3.1.2 Access

There is one existing entrance to the site which is via the Parkway Retail Park Roundabout to the west.

It is planned to access the Proposed Development, during construction and once operational, from the existing Parkway Retail Park Roundabout and a new site entrance off the Dublin Road (R445). The new entrance will operate as a left in and left out junction arrangement facilitating left-turn ingress and egress movements only. Figure 15-3 shows the planned access points to the Site.

Further details on access are discussed in Chapter 13 (Materials Assets - Traffic and Transportation) of the EIAR, and also in the Traffic and Transportation Assessment (TTA) prepared by Punch Consulting Engineers (Appendix 13.1) and the Mobility Management Plan (MMP), also prepared by Punch Consulting Engineers which is submitted with the application documentation.

Figure 15-3 Site Layout Plan showing Proposed Site Access Locations (Source: Site Plan is Extract from Landscape Plan Drawing PAV-JBA-XX-XX-DR-L-0002, JBA, May 2026)



15.3.1.3 Power and Electrical Supply

There are 110kV High Voltage overhead power lines and pylons which transverse the eastern portion of the site. (Note: These are illustrated as dashed lines in Figure 15-3 above.)

The Utility Report prepared by Moloney Fox Consulting Engineers (May 2026) states that the site is well located with regards to ESB infrastructure. The local ESB Medium Voltage infrastructure has available capacity. Refer to the aforementioned Utility Report, which accompanies the planning application for further details in relation to the ESB Services.

15.3.1.4 Telecommunications

The site is also well located with regards to telecommunication infrastructure with existing EIR (voice and broadband) and Enet (fibre) underground ducts in the vicinity of the development on the site, running adjacent to the site boundary along the Dublin Road (R445), and to the south west of the development site in the existing residential developments.

Refer to the aforementioned Utility Report, which accompanies the planning application for further details in relation to the EIR and Enet telecommunication utilities.

15.3.1.5 Surface Water Infrastructure

As outlined in the Engineering Planning Report (Punch Consulting Engineers, May 2025) (included with the planning application documentation), there is no existing artificial surface water drainage network within the proposed site. Run-off from the area is drained via infiltration to ground in surrounding areas under the influence of gravity.

A review of EPA mapping shows two (2) no. unnamed surface watercourses within the Proposed Development Site boundary flowing in an easterly direction towards an OPW arterial drainage channel c. 160 m to the east referred to by the EPA as 'Industrial Estate / Galvone Stream' watercourse. However, based on the site walkovers and surveys undertaken by Punch Consulting Engineers, these are no longer evident on the site. As stated in the Engineering Planning Report (May 2026), no upstream catchments are believed to connect to these drains as all upstream sites have been developed with their own surface water networks which discharge into the main drainage network. There is an open drain at the eastern site boundary connected to Industrial Estate / Galvone Stream which ultimately discharges to the Groody River. The Groody River (EPA Code: IE_SH_25S012600), a tributary of the Shannon (Lower), is located c. 200 m to the east of the site and flows in a northerly direction. The local hydrological environment is illustrated in Figure 6-3 in Chapter 6 (Hydrology and Hydrogeology).

A review of record drawings provided by LCCC shows no evidence of a surface water pipe network in the area. A review of record drawings provided by Uisce Éireann shows evidence of surface water sewers in the adjacent residential development west of the site. There are also existing surface water sewers 200m northwest of the site. There is no recorded evidence of surface water sewers in the Dublin Road (R445) however there are existing gullies located on the road.

Refer to the Engineering Planning Report (Punch Consulting Engineers, May 2025) included with the planning application documentation for further information on the existing surface water infrastructure.

15.3.1.6 Foul Drainage Infrastructure

As outlined in the Engineering Planning Report (Punch Consulting Engineers, May 2025) (included with the planning application documentation), a review of record drawings provided by Uisce Éireann shows no evidence of foul drainage within the proposed site. There is an existing foul sewer in the Parkway Retail Park which ultimately discharges into a combined sewer on Childers Road.

Refer to the Engineering Planning Report (Punch Consulting Engineers, May 2025) included with the planning application documentation for further information on the existing foul water infrastructure.

15.3.1.7 Potable Water Supply

As outlined in the Engineering Planning Report (Punch Consulting Engineers, May 2025) (included with the planning application documentation), a review of record drawings provided by Uisce Éireann indicates existing watermain layout in the vicinity of the site. There is a 300mm diameter Ductile Iron pipe which runs along the northern Site boundary in the Dublin Road (R445).

15.4 Characteristics of the Proposed Development

This section describes the built services and infrastructure for the Proposed Development during both construction and operational phases.

Chapter 2 (Description of the Proposed Development) provides a detailed overview of the lifecycle of the project, including reference to the architectural and civil engineering, drawings, plans, reports, and other relevant documents to define the Proposed Development.

15.4.1 Construction Phase

15.4.1.1 Land Use, Property, and Access

The Proposed Development site covers an area of c. 6.18 ha.

All access and egress will be via the site entrance at the Parkway Valley Roundabout to the west of the site and the planned new site entrance off the Dublin Road (R445), once it has been established.

Perimeter hoarding will be erected at commencement of the project and remain in place until construction is completed. Vehicular and pedestrian gates provided at the site entrance. The gates will be locked outside of working hours.

Security personnel will be present at the entrance/exit of the site to ensure all egressing traffic will do so safely.

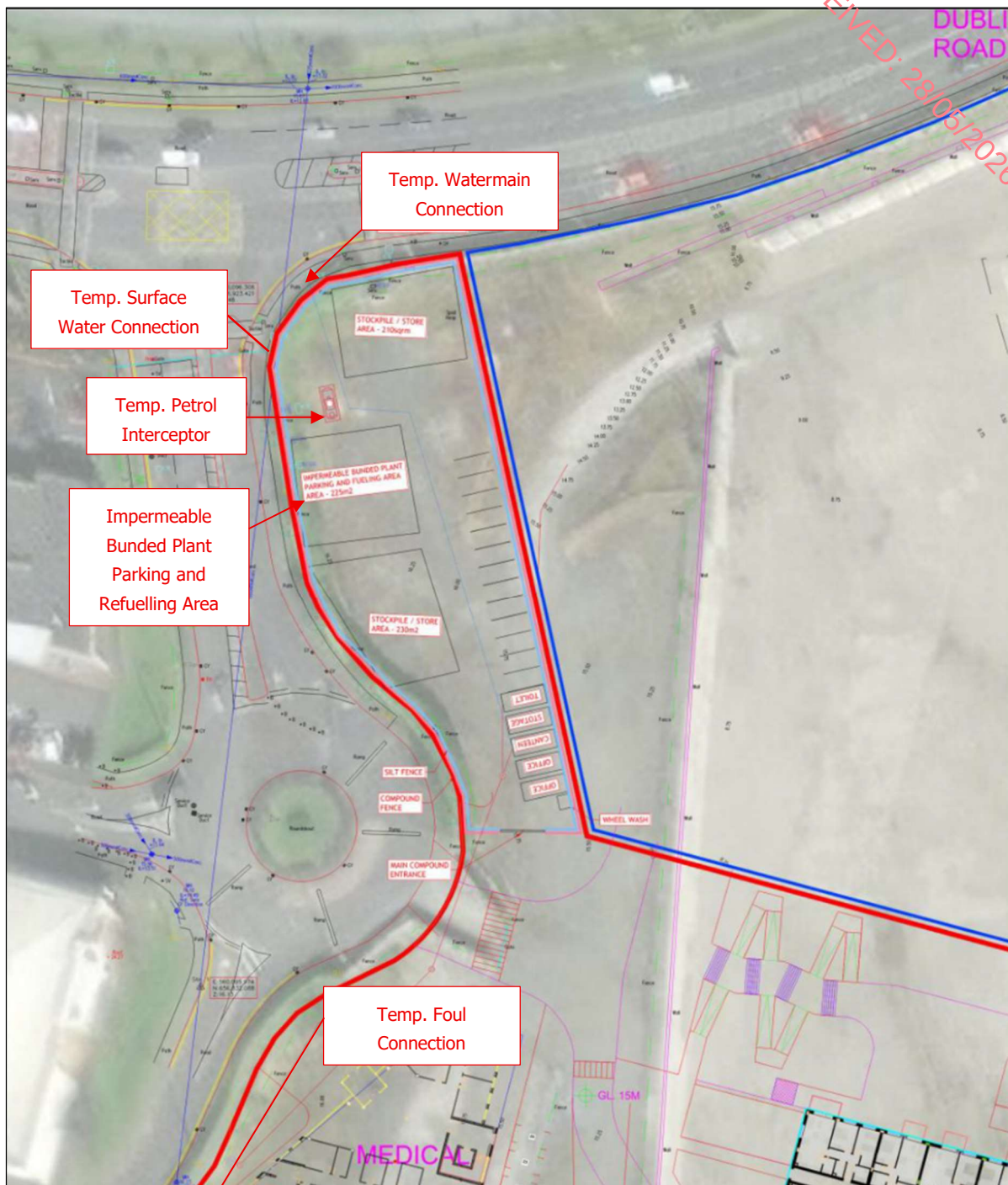
A site compound will be established in the north west corner of the site adjacent to the Parkway Valley Roundabout site entrance. It will facilitate site offices, welfare facilities, canteen, materials drop off and storage area. The proposed location and layout of the site compound is illustrated in Figure 15-4. Refer to CEMP (May 2026) by Punch Consulting Engineers for further details regarding the site compound.

A wheel cleaning facility will be installed near to the site compound for use by vehicles exiting the site when appropriate to prevent any dirt being carried out into the public road. A road sweeper will be employed as required to keep the public road around the site clean.

Carparking for construction personnel will be accommodated within the Site. Construction personnel will also be encouraged to walk, cycle, or use public transport, and information on local transport services will be published on site.

Access arrangements and potential traffic safety impacts are considered in Chapter 13 (Traffic and Transportation) and also in the Traffic and Transportation Assessment (TTA), prepared by Punch Consulting Engineers (Appendix 13.1 of this EIAR).

Figure 15-4 Construction Compound showing temporary connections to Surface Water, Foul and Water Supply Infrastructure (Source: Punch, CEMP, May 2026)



15.4.1.2 Power and Electrical Supply

The 110kV High Voltage overhead power lines and pylons which transverse the eastern portion of the site will remain as is as they do not affect the development works.

During construction, the contractors will require temporary power for onsite accommodation, and construction equipment / plant. Generators will be used until such time as a connection to the ESB Network can be established. The generators will be fuelled with Hydrotreated Vegetable Oil (HVO), rather than with diesel. All temporary electrical infrastructure will be removed when construction is complete.

During construction, the permanent electricity connection will be made to the existing ESB Medium Voltage 10/20kV underground network to supply the development, once operational. The Utility Report prepared by Moloney Fox Consulting Engineers (May 2026) states that local ESB Medium Voltage infrastructure has available capacity. It also states that the extension of the ESB infrastructure has been agreed in consultation with the developer (Applicant) and ESB Network Engineers.

Any above ground lines or underground lines (400Volts) shall be diverted to accommodate the Proposed Development. There is minimum amount of line diversions to be carried on the site, with no impact on electricity supply to neighbouring properties.

As stated in the CEMP (May 2026) prepared by Punch Consulting Engineers, electrical connections will be made by suitably qualified personnel following consultation with the relevant authorities and will be cognisant of subsequent construction works. It also states that high voltage connections will be established for heavy duty equipment and site facilities, as required. All electrical works, including connection to the ESB network will be carried out by a suitably qualified contractor in conjunction with ESB Networks.

Refer to the aforementioned Utility Report by Moloney Fox Consulting Engineers, which accompanies the planning application for further details in relation to the ESB Services.

15.4.1.3 Telecommunications

The construction site will require internet phone connectivity for external communication with clients, contractors, and suppliers. Mobile phones are expected to be used for this purpose. Internet connectivity will be achieved through the use of wireless networks.

Existing EIR and Enet telecommunications infrastructure currently runs underground along the footpath northern Site boundary. As part of the construction phase, the EIR and Enet ducting will be extended into the site to provide both voice and broadband communications to the development to cater for the needs of the residential and commercial occupants. All works on the telecommunications network will be carried out in conjunction with the service providers.

Refer to the aforementioned Utility Report by Moloney Fox Consulting Engineers, which accompanies the planning application for further details in relation to the telecommunication infrastructure.

15.4.1.4 Surface Water Infrastructure

A temporary connection from the proposed site compound to the public surface water drainage network will be established to manage surface water runoff from the site compound for the duration of construction, subject to agreement with LCCC. Refer to Figure 15-4 for the indicative proposed surface water connection location, which is an extract from Figure 3-1 of the CEMP prepared by Punch Consulting Engineers (May 2026). The construction contractor will employ strict quality control measures while establishing the temporary connection. All temporary surface water infrastructure will be removed when construction is complete, where required.

It is proposed to construct a new fully separated drainage network and extensive SuDS features including green roofs, permeable paving, bioretention areas, swales, infiltration trenches, tree-pit attenuation and an attenuation pond which together manage, treat and attenuate runoff generated on site prior to discharge. Discharge from the site will be controlled to the greenfield-equivalent rate via a hydrobrake located upstream of the stormwater outfall, which will convey flows by gravity to the Industrial Estate / Galvone Stream, which discharges to the Groody River, 200m east of the Site boundary. The new surface water drainage system will be constructed following strict quality control measures.

Until such time as the new surface water drainage system is in place, temporary measures will be required to control and treat surface water runoff from the site. Surface water run-off from excavations/earthworks cannot be prevented entirely and is largely a function of prevailing weather conditions. All water

intercepted on-site will be managed and controlled for the duration of the construction works to prevent flow of silt-laden surface water flowing into watercourses. Control measures will include installation of drainage ditches, settlement ponds and/or tanks to allow attenuation, settlement and silt trapping, with testing prior to discharge. Attenuated and treated surface water will either be discharged to the LCCC existing storm water network (subject to agreement with LCCC), discharged to permeable vegetated areas or discharged to the open drain which flows to the Industrial Estate / Galvone Stream. If clean water is to be discharged into the open drain, measures like baffles, geotextiles, sediment mat, or riprap will be set up at the discharge point to avoid disturbing the watercourse. The design of the outfalls and the construction method statements for their installation shall be agreed with IFI prior to construction.

Planned measures for controlling surface water during the construction phase are set out in Chapter 6 (Hydrology and Hydrogeology) of this EIAR. These measures have been incorporated in the CEMP, prepared by Punch Consulting Engineers (May 2026).

15.4.1.5 Foul Drainage Infrastructure

Welfare facilities (canteens, toilets etc.) will be available within the proposed construction compound and these will remain in place for the construction of the Proposed Development. The Main Contractor will ensure that sufficient facilities are always available to accommodate the number of employees on site.

It is anticipated that for the initial stages of construction portable sanitary facilities will be provided. The facilities will need to have the foul water collected by a licensed waste sewerage contractor. Wastewater will be disposed of off-site in an appropriate manner and in accordance with the relevant statutory regulations, to prevent the pollution of watercourses.

A temporary connection for foul water drainage will be made to the public network for the construction phase, subject to consultation and agreement with Uisce Éireann. Refer to Figure 15-4 for the indicative proposed foul water connection location, which is an extract from Figure 3-1 of the CEMP prepared by Punch Consulting Engineers (May 2026). All temporary foul water infrastructure will be removed when construction is complete, where required

It is proposed to construct a new foul sewer network to serve the operational phase of the Proposed Development, completely separate from the storm sewer, and will be collected in a pump on the eastern boundary of the Proposed Development. All works on the foul drainage network will be carried out by a suitably qualified contractor in conjunction with Uisce Éireann. A Confirmation of Feasibility from Uisce Éireann was received in October 2025 noting that a wastewater connection is feasible without any infrastructure upgrade.

15.4.1.6 Potable Water Supply

The construction contractor will require a water source for the duration of the construction works. Water will be required for welfare facilities, dust suppression and general construction activities. Initially the contractor will need have water delivered, until such time as a temporary connection to the public watermain at the Dublin Road (R445) can be established, subject to consultation and agreement with Uisce Éireann. The temporary connection will be subject any restrictions and requirements Uisce Éireann may impose.

It is proposed to construct a 225 mm diameter watermain to serve the operational phase of the Proposed Development which will connect to the existing 300mm Ductile Iron watermain in the Dublin Road (R445). All works on the watermain will be carried out by a suitably qualified contractor in conjunction with Uisce Éireann. A Confirmation of Feasibility from Uisce Éireann was received in October 2025 noting that a water supply connection is feasible subject to upgrades of 57 m of existing watermain from 200 mm to 350 mm, to be funded by the Applicant.

15.4.2 Operational Phase

15.4.2.1 Land Use, Property, and Access

The Proposed Development comprises 5 no. blocks with a total of 403 no. residential units, ranging from 5 to 8 storeys in height; a medical centre located at the western edge of the site; a creche located at ground level within Block B; and all associated site works and development.

The Proposed Development and the plans for the future build out of the overall Masterplan site to accommodate employment / enterprise uses are compatible with the current 'mixed use' zoning and strategic planning objectives of the site as a 'consolidation and opportunity site' as set out in the Limerick Development Plan (2022-2028). A proposed variation of the Limerick Development Plan 2022 - 2028 provides for primarily residential use on the remainder of the masterplan site. While the proposed variation (revised Objective PV01 proposed under Proposed Variation No. 3) had not been adopted at the time of writing, the masterplan principals have been developed with flexibility to be able to accommodate commercial or residential land uses.

As previously stated in Section 15.3.1.2, access to the Proposed Development, once operational, will be from the existing Parkway Retail Park Roundabout and the new site entrance off the Dublin Road (R445). The new entrance will operate as a left in and left out junction arrangement facilitating left-turn ingress and egress movements only. Figure 15-3 shows the planned access points to the Site.

Access arrangements and potential traffic safety impacts are considered in Chapter 13 (Materials Assets - Traffic and Transportation) of the EIAR, also in the Traffic and Transportation Assessment (TTA) prepared by Punch Consulting Engineers (Appendix 13.1) and the Mobility Management Plan (MMP), also prepared by Punch Consulting Engineers which is submitted with the application documentation.

15.4.2.2 Power and Electrical Supply

The power requirements for the Proposed Development will be supplied via a connection to the National Grid via tying into the local Medium Voltage ESB infrastructure. The existing ESB 10/20kv underground network will be extended into the Site, to new ESB Substations. The development shall be served using one substation per building, based on the quantity of apartments per building. Mini pillars and micro pillars shall be provided to bring local ESB services to serve external services. The proposed locations of the new substations are illustrated on the architectural layout drawings submitted with the application documents.

Provision shall be made to deliver adequate services to the medical centre, creche and each apartment to cater for both the electrical needs of the unit in terms of power for heat pumps and electrical car charging facilities.

The extension of the ESB infrastructure has been agreed in consultation with the Applicant and ESB Network Engineers. A full connection application will be submitted to ESB Network, following planning permission being received for the Proposed Development.

Refer to the aforementioned Utility Report by Moloney Fox Consulting Engineers, which accompanies the planning application for further details in relation to the ESB Services.

The Climate Action Statement by Moloney Fox Consulting Engineers (May 2026) outlines a coordinated suite of design and building services measures aimed at minimising operational energy demand across the Proposed Development. Energy efficiency is embedded within the apartments through the use of high-efficiency exhaust air heat pump systems for space heating and hot water, Demand Control Ventilation (DCV) systems which modulate ventilation rates in response to occupancy and internal air quality, and the incorporation of low-energy LED lighting with advanced control systems to optimise consumption. In addition, roof-mounted solar photovoltaic (PV) arrays will generate on-site renewable electricity, offsetting

grid demand. Further detail is provided in the Climate Action Statement, which is included with the application documents.

15.4.2.3 Telecommunications

Existing EIR and Enet telecommunications infrastructure currently runs underground along the footpath northern Site boundary. The EIR and Enet ducting will be extended into the site to provide both voice and broadband communications to the development to cater for the needs of the residential and commercial occupants. All works on the telecommunications network will be carried out by a suitably qualified contractor.

15.4.2.4 Surface Water Infrastructure

As stated in Section 15.4.1.4, a new surface water sewer network shall be provided for the Proposed Development which will include extensive SuDS features including green roofs, permeable paving, bioretention areas, swales, infiltration trenches, tree-pit attenuation and a nature-based attenuation pond which together manage, treat and attenuate runoff generated on site prior to discharge.

All surface water run-off from roof areas and hardstanding areas shall be collected in the new gravity pipe surface water drainage network. The SuDS measures will retain rainwater until it is used via evapotranspiration in the green areas or filters through the drainage layers to overflow into the proposed new surface water drainage network. In accordance with the SuDS Manual CIRIA C753 the pollution prevention guidelines have been followed to ensure appropriate levels of treatment are provided before surface water run-off from the site is infiltrated to ground. Section 2.5 of the Engineering Planning Report illustrates how the proposed green roof, swales/infiltration trenches and rain gardens will effectively remove pollutants from the runoff prior to discharging into the surface water drainage network, which ultimately flows into the Groody River. In addition, a petrol interceptor (Klargester Class 1 Interceptor or similar approved) will be installed upgradient of the attenuation pond to treat the surface water prior to discharge to the pond.

Refer to the Proposed Drainage Layout Drawings 231171-PUNCH-XX-XX-DR-C-0101 (Sheet 1) and 231171-PUNCH-XX-XX-DR-C-0102 (Sheet 2) prepared by Punch Consulting Engineers which illustrate the surface water (and foul) drainage design. These are included with the planning application drawings.

Discharge flow from the site will be controlled to the greenfield-equivalent rate (2 l/s/ha) via a hydrobrake flow control device located upstream of the stormwater outfall, which will convey flows by gravity to the Industrial Estate / Galvone Stream, which discharges to the Groody River, 200m east of the Site boundary.

This drainage design has been developed in compliance with the LCCC Surface Water Drainage and SuDS Specification with the aim of providing a sustainable drainage solution ensuring, in so far as feasible, that the development has a minimal impact on the existing public surface water sewer system and the receiving environment while also providing amenity and opportunities for enhancing biodiversity.

Further details of the proposed surface water infrastructure drainage design are set out in the Engineering Planning Report and illustrated in the Engineering Drawings prepared by Punch Consulting Engineers (May 2026) which accompany the planning application and in the Chapter 6 (Hydrology and Hydrogeology) of this EIR.

15.4.2.5 Foul Drainage Infrastructure

The foul water network for the Proposed Development has been designed using Causeway Flow software, in accordance with the DOEHLG Recommendations for Site Development Works for Housing Areas and the Uisce Éireann Code of Practice for Wastewater Infrastructure. The foul water system is fully separated from the proposed surface water network.

The new foul sewer network is proposed within the site, completely separate from the storm sewer, and will be collected in a pump on the eastern boundary of the Proposed Development. The pump has been designed in accordance with Uisce Éireann with the proposed rising main passing through the site and discharging into the existing drainage in the Parkway Retail Park which ultimately discharges into a combined sewer on Childers Road. The final connection location is to be agreed with Uisce Éireann.

The foul water design is based on the following parameters extracted from the Engineering Report prepared by Punch Consulting Engineers (May 2026):

- ▶ Occupancy rate: 2.7 persons per dwelling
- ▶ Residential flow rate: 150 L/person/day
- ▶ Medical facility flow rate: 450 L/person/day
- ▶ Crèche flow rate: 100 L/person/day
- ▶ Average demand: 1.25 DWF
- ▶ Peaking factor: 6 DWF (Residential) and 4.5 DWF (Creche and Medical Centre)
- ▶ Minimum self-cleansing velocity: 0.75 m/s
- ▶ Minimum pipe diameter: 150 mm

These parameters inform the hydraulic design to ensure adequate capacity, self-cleansing conditions, and compliance with national wastewater infrastructure standards.

Based on the development's calculated population of 1,507 no. people, the peak effluent flow (Design Flow) has been calculated to be 17.13 l/s (detailed calculations are presented in the Engineering Services Report, Punch Consulting Engineers, May 2025).

A Pre-Connection Enquiry (PCE) was submitted to Uisce Éireann on 9th June 2025, and a Confirmation of Feasibility (COF) was received from Uisce Éireann on 30th October 2025 which confirms the feasibility of the proposed wastewater connections (COF Ref. DS25006639) without any infrastructure upgrade necessary.

The foul sewer for the Proposed Development eventually discharges to Limerick Wastewater Treatment Plant (WWTP) (D0013) for full treatment. According to the 2024 Annual Environmental Report (AER), WWTP currently has adequate operational capacity to accommodate the additional flows generated by the Proposed Development. Following treatment, the final effluent from Limerick WWTP is discharged into Limerick Dock transitional waterbody.

Refer to the Engineering Report, prepared by Punch Consulting Engineers (May 2026) submitted as part of the planning application for further information on the proposed foul water management and design.

Further details of the proposed foul water infrastructure drainage design are set out in the Engineering Planning Report and illustrated in the Engineering Drawings prepared by Punch Consulting Engineers (May 2026) which accompany the planning application.

15.4.2.6 Potable Water Supply

It is proposed to construct a 225 mm diameter watermain to serve the Proposed Development based on the above calculated demand. The proposed watermain will connect to the existing 300mm Ductile Iron watermain in Dublin Road (R445). Please refer to PUNCH Consulting Engineers drawing no. 231171-PUNCH-XX-XX-DR-C-0301 for the proposed watermain layout.

This feed will provide potable water to the Proposed Development. A bulk water meter shall be provided at the site boundary at the location of the proposed connection to the existing watermain. The watermain layout has been designed in accordance with "Uisce Eireann Code of Practice for Water Infrastructure". All watermains are to be constructed in accordance with Uisce Eireann Code of Practice and the Local Authority's requirements.

To reduce the water demand on Local Authority water supplies and to reduce the foul discharge from the development, water conservation measures will be incorporated in the sanitary facilities throughout the commercial and retail areas, e.g. dual flush toilets, monobloc low volume push taps and waterless urinals.

It is generally accepted that the design loading for foul drainage can be used to evaluate an approximation of the water demand on the site. With reference to Irish Water's Code of Practice for Water Infrastructure, the average daily flow is calculated as the number of persons multiplied by the flow rate per person. The average day peak week flow is taken to be 1.25 x the average flow, and the peak demand is taken to be the average day peak week flow multiplied by a peaking factor of 5.

The maximum average potable water demand was calculated as 3.969 l/s, with a peak demand of 19.845l/s, as detailed in the calculations shown in the Engineering Planning Report (Punch Consulting Engineers, May 2025).

There will be an underground static fire-fighting water tank with a minimum storage capacity of 90,000 litres. (Note: tank size is provisionally pending a review of fire-fighting flow requirements).

A Pre-Connection Enquiry (PCE) was submitted to Uisce Éireann on 9th June 2025, and a Confirmation of Feasibility (COF) was received on 30th October 2025 in response, stating that a potable water connection to the public system was feasible subject to upgrades of 57 m of existing watermain from 200 mm to 350 mm, to be funded by the applicant.

15.4.3 Do Nothing Scenario

In the event that the Proposed Development does not proceed, the subject lands would remain in their current state in the short term. However, having regard to the zoning, location and development context of the lands, it is considered likely that they would be subject to a future planning application for an alternative development of a broadly similar nature.

As such, the 'Do Nothing' scenario would not represent a permanent absence of development, but rather a delay in the delivery of development and associated demand for utility services at this location.

15.4.4 Decommissioning

In the event that the Proposed Development is decommissioned, it is anticipated that the buildings and associated infrastructure would be subject to redevelopment for an alternative use, having regard to the planning context of the site.

Any such redevelopment or modification would be required to comply with the relevant planning and environmental legislation in force at the time. This may include the requirement for planning permission and, where applicable, the preparation of an EIAR.

15.5 Potential Impacts of the Proposed Development

The potential impacts of the Proposed Development on material assets specifically utilities in the construction and operational phase are outlined below. These chapters should be read in conjunction with Chapter 6 (Hydrology and Hydrogeology), Chapter 13 (Traffic and Transportation), Appendix 13.1 (TTA), and Chapter 16 (Interactions).

15.5.1 Construction Phase

15.5.1.1 Land Use, Property, And Access

To minimise nuisance for neighbouring properties, the Construction Environmental Management Plan prepared by Punch Consulting Engineers (May 2026) will be implemented and adhered to by the construction Contractor and will be overseen and updated as required if site conditions change by the Project Manager, Environmental Manager, Resource Manager, and Ecological Clerk of Works where relevant.

All mitigation measures outlined within this EIAR, and within the CEMP will be implemented during the construction phase. The construction contractor will update this CEMP to include any additional mitigation required to ensure compliance with any subsequent planning conditions relevant to the Proposed Development.

The potential impact associated with land use, property, and access for the construction phase will be, **negative, not significant, and short term.**

15.5.1.2 Power Supply and Electrical Supply

During the initial stages of the construction phase, power requirements will be met by generators fuelled with hydrotreated vegetable oil (HVO). Following connection to the National Grid, the electrical demand associated with construction activities will be limited in scale and is not anticipated to give rise to any perceptible effects on the capacity or reliability of the local electricity supply network.

Any excavations within the vicinity of existing electrical services will be carried out in consultation with ESB Networks to ensure there is no impact on existing users. The electrical connection should have no disruptions to the National Grid during connection works.

All utilities work shall be carried out in accordance with the relevant requirements of ESB Networks. These works will be carried out in a manner that is safe, and which minimises interruptions of service which might affect residents and businesses, and adjacent developments.

The potential impact associated with power and electrical supply for the construction phase in the absence of mitigation measures will be a **negative, not significant, and short term.**

15.5.1.3 Telecommunications

The use of telecom lines will not be required during the construction phase. The locations of existing EIR and Enet services are presented in the Utility Report prepared by Moloney Fox Consulting Engineers (May 2026) which accompanies the planning application. The connection into the EIR and Enet telecommunications network will be undertaken by suitably qualified and authorised personnel. These works will be carried out in a manner that is safe, and which minimises interruptions of service which might affect residents and businesses, and adjacent developments.

The potential impact on telecommunications infrastructure during the construction phase in the absence of mitigation measures is **neutral, not significant, and short term.**

15.5.1.4 Surface Water Infrastructure

During the construction phase, there is potential for rainfall run-off and dewatering water during the construction phase may contain increased silt levels or otherwise become polluted from construction activities. Suspended solids in runoff water may result in an increase in suspended sediment load, resulting in increased turbidity, which may in turn impact on local infiltration capacity, or downstream infrastructure or watercourses.

The employment of good construction management practices and full adherence to the mitigation measures set out in Chapter 6 (Hydrology and Hydrogeology) and the Construction & Environmental Management Plan (CEMP) will minimise the risk of pollution of soil, storm water run-off, or groundwater. Such practices include the proper storage of spoil / loose materials on site, such as stockpiled excavated materials to be used for landscaping purposes; Aggregate materials such as sands and gravels will be stored in clearly marked receptacles in a secure compound area within the contractors' compound on site. There is no likely impact on surface water infrastructure as a result.

The potential impact on surface water networks during the construction phase in the absence of mitigation measures is **negative, slight, and short term**.

15.5.1.5 Foul Drainage Infrastructure

Welfare facilities will be provided for the construction workers on site during the construction works. Initially portable toilets will be provided and foul effluent will be appropriately managed and treated off site. For the temporary connection to the foul drainage infrastructure, the works contractor will be obliged to comply with any conditions of a temporary connection agreement with Uisce Éireann, if required, to control discharge quality and rate of flow and remove any wastewater collected on site.

All works on the foul drainage network for the permanent connections will be carried out by a suitably qualified contractor in conjunction with Uisce Éireann.

The potential impact on foul drainage for the construction phase is **negative, imperceptible, and short term**.

15.5.1.6 Potable Water Supply

The water demand during the construction phase will not be significant enough to affect existing pressures. The potential impact on potable water supplies and infrastructure during the construction phase is **negative, imperceptible, and short term**.

15.5.1.7 Natural Gas

There is no requirement for natural gas connection, therefore during the construction phase there is no potential impact.

15.5.2 Operational Phase

15.5.2.1 Land Use, Property and Access

During the operational phase the Proposed Development is not anticipated to generate significant air (including odour), noise, water emissions or traffic impacts during normal operating conditions; these have been discussed further in the respective EIAR chapters, Chapter 6 (Hydrology and Hydrogeology), Chapter 8 (Air Quality), Chapter 9 (Climate), Chapter 10 (Noise and Vibration), and Chapter 13 (Traffic and Transportation).

The Proposed Development is consistent with the zoning of these lands.

The overall potential impact associated with land use, property, and access during the operational phase will be **localised neutral, not significant, and long term**.

15.5.2.2 Power Supply and Electrical Supply

Once the Proposed Development is operational, electricity will be provided to the site via the National Grid tying in with existing infrastructure, thus, the Proposed Development will increase the demand on existing power and electrical utilities. As detailed in Chapter 2 (Section 2.5.5) sustainable energy measures

including PV (Photovoltaics) on the roof have been considered and incorporated into the design of the Proposed Development. The PV will reduce demand and effects on the mains network.

The Proposed Development does not lie within any Solar Safeguarding Zones (SSZ) set out in the *Planning and Development (Solar Safeguarding Zone) Regulations 2022*. A SSZ is an area around an airport, aerodrome or helipad in which there is a potential for glint or glare from solar panels to impact aviation safety. Out of an abundance of caution, a Glint and Glare assessment has been undertaken to assess the potential impact from the proposed solar PV panels on receptors at Coonagh Airfield and University Hospital Limerick. From the analysis and discussions contained herein, it is considered that there will not be any significant nuisance effects from glint and glare on these receptors as a result of the proposed roof-mounted solar PV panels. The Glint and Glare report, prepared by Macro Works Ltd. is included as Appendix 15.1 of this EIAR.

During the operational phase, maintenance of utilities infrastructure on the site will be carried out in accordance with the relevant requirements of the various utilities' providers / authorities. As such, no significant impacts on services or utilities themselves are predicted to occur as a result of the operational phase. ESB have confirmed the feasibility of the proposal in terms of electrical demand.

Based on these discussions on availability of supply, there is a **neutral, imperceptible, and long term** effect on electrical supply during the operational phase of the Proposed Development.

15.5.2.3 Telecommunications

There will be a marginal increase in demand on the local telecommunications network during the operational phase. The Proposed Development will connect to existing telecommunications infrastructure, with local ducting extended as required to service the site, in accordance with the requirements of the relevant service providers.

Telecommunications services are delivered on a commercial basis and networks are continually upgraded and expanded by operators to meet demand. The connection to the wider telecommunications network will be undertaken by a licensed telecommunications provider.

In this context, the operational phase demand associated with the Proposed Development is not expected to give rise to any material effects on telecommunications infrastructure. The likely impact is therefore assessed as **neutral, imperceptible and long-term**.

15.5.2.4 Surface Water Infrastructure

During operation, the primary risk of water quality impact is surface water runoff from roads and car parking areas which can potentially contain elevated levels of contaminants such as hydrocarbons.

With proposed drainage design including extensive SuDS features, the potential impacts during the operational phase on surface water quality are considered to be **neutral, imperceptible, and long-term**.

15.5.2.5 Foul Drainage Infrastructure

A Confirmation of Feasibility from Uisce Eireann was received in October 2025 noting that a wastewater connection is feasible without any infrastructure upgrade.

The foul sewer for the Proposed Development eventually discharges to Limerick Wastewater Treatment Plant (WWTP) (D0013) for full treatment. According to the 2024 Annual Environmental Report (AER), WWTP currently has adequate operational capacity to accommodate the additional flows generated by the Proposed Development. Following treatment, the final effluent from Limerick WWTP is discharged into Limerick Dock transitional waterbody.

There will be a hydrological connection the Lower River Shannon SAC and River Shannon and River Fergus Estuaries SPA sites through the wastewater effluent from the wastewater treatment plant (WWTP). However, the WWTP operates under an EPA licence with defined emission limit values and compliance conditions to ensure that treated effluent discharges do not compromise the achievement of Water Framework Directive environmental objectives in the receiving waterbody.

Considering the design of the wastewater infrastructure on and off site, the impact is expected to be **neutral, imperceptible, and long-term**.

15.5.2.6 Potable Water Supply

A Confirmation of Feasibility from Uisce Éireann was received in October 2025 noting that a water supply connection is feasible subject to upgrades required to be funded by the Applicant.

Water saving devices are incorporated within the Proposed Development units, in order to conserve the use of water, as part of the internal fit-out. A bulk water meter is to be provided at the connection to the public watermain at the development entrance. All metering is to be provided in accordance with Uisce Éireann requirements.

Based on the feasibility of connection issued by Uisce Éireann, the potential impact on potable water infrastructure for the operational phase is **neutral, imperceptible, and long term**.

15.6 Mitigation Measures

15.6.1 Construction Phase

Consultation with LCCC, Uisce Éireann, ESB Networks, EIR and Enet and other relevant service providers within the locality and compliance with any requirements or guidelines they may have will ensure a smooth construction schedule without disruption to local and business community. The works contractor will be obliged to put best practice measures in place to ensure, any planned interruptions are agreed in advance with the utilities suppliers.

The construction contractor will employ strict quality control measures will be undertaken while laying pipes and utilities to minimise or eradicate infiltration and ex-filtration.

Prior to commencing any construction activities, the contractor shall conduct a comprehensive utility locating survey using advanced technologies such as ground-penetrating radar (GPR) and electromagnetic induction methods. This survey will accurately identify the location and depth of all existing underground services, including high voltage (HV) cables, water and gas pipelines, and telecommunication lines. Based on the results of the utility locating survey, exclusion zones will be demarcated around identified utilities. These zones will indicate areas where construction activities are restricted or subject to specific safety protocols.

Punch Consulting Engineers have prepared a CEMP (May 2026) which is included with the planning application documentation. This outlines the construction techniques and methodologies which will be implemented during construction of the Proposed Development. The mitigation measures set out in this EIAR and the CEMP will be implemented and adhered to by the construction contractor and will be overseen and updated as required if site conditions change by the Project Manager, Environmental Manager, Resource Manager and Ecological Clerk of Works where relevant. All personnel working on the Site will be trained in the implementation of the procedures. The construction contractor will provide a detailed Construction Environmental Management Plan (CEMP) that will include any subsequent planning conditions relevant to the Proposed Development and set out further detail of the overarching vision of how the construction Contractor of the Proposed Development manage the Site in a safe and organised manner.

15.6.2 Operational Phase

A Confirmation of Feasibility (COF Ref. DS25006639) was received from Uisce Éireann on 30th October 2025 which confirms the feasibility of the proposed wastewater connections without infrastructure upgrade by Uisce Éireann. The COF confirmed the water supply connection was feasible subject to upgrades of 57 m of existing watermain from 200 mm to 350 mm, to be funded by the Applicant. Copy of received Confirmation of Feasibility is included in Appendix G of the Engineering Planning Report (Punch Consulting Engineers, May 2026).

The Proposed Development stormwater drainage network design includes sustainable drainage systems (SuDS) these measures by design ensure the stormwater leaving the site is of a suitable quality.

Water metering arrangements are to be upgraded at the connection location, in line with Uisce Éireann standards. A bulk water meter is to be provided at the connection to the public watermain at the development entrance. All metering is to be provided in accordance with Uisce Éireann requirements.

Any necessary maintenance or upgrades of on-site utilities infrastructure during the operational phase of the Proposed Development will be carried out in accordance with the specifications of the relevant service providers and facilitated by facilities management.

15.7 Monitoring Or Reinstatement Measures

No additional monitoring or reinstatement is required.

15.8 Residual Effects Of The Proposed Development

15.8.1 Construction Phase

The works contractor will be obliged to put best practice measures in place and work in accordance with the CEMP. The implementation of mitigation measures within each chapter of this EIAR and measures detailed in Section 15.6.1 of this chapter will ensure that the residual impacts on the material assets considered in this chapter during the construction phase will be **neutral, not significant, and short term.**

15.8.2 Operational Phase

The Proposed Development requires electrical power, water supply and connection to the stormwater and foul water networks, respectively.

The implementation of mitigation measures within each chapter of this EIAR and detailed in Section 15.6.2 of this chapter will ensure that the residual impacts on the material assets considered in this chapter during the operational phase will be **neutral, imperceptible, and long-term.**

15.9 Cumulative Impacts of the Proposed Development

The cumulative impact of the Proposed Development with any relevant other planned or permitted developments are discussed below. For details on the developments considered for cumulative impacts refer to Chapter 2 and Appendix 2.1 of this EIAR.

15.9.1 Construction Phase

The Proposed Development entails minimal use of public material assets (utilities) during construction therefore there is limited opportunity for the causation of cumulative impacts during the construction phase of the Proposed Development in combination with other planned or permitted developments.

This list of developments (Chapter 2, Appendix 2.1 of this EIAR) have been reviewed all developments are capable of combining with the Proposed Development and resulting cumulative effects on material assets. Coordination and consultation will be had between the construction contractor and relevant service providers within the locality to facilitate the Proposed Development. The Proposed Development will be in accordance with the requirements of statutory providers for electrical infrastructure, surface water drainage, foul drainage, and water infrastructure.

The implementation of mitigation measures during construction works as well as the compliance of adjacent development with their respective agreement with network providers (Uisce Éireann, ESB Networks, EIR and Enet) means that the Proposed Development in combination with other exiting and permitted development is not likely to result in prolonged utility disruption; notable extra demand on a utility; or medium-term disruption to a significant piece of infrastructure. It is unlikely that there will be significant cumulative effects with other planned or permitted developments (as described in Chapter 2).

The residual cumulative effects on the material assets during the construction phase for the Proposed Development will be **negative, not significant**, and **short-term**.

15.9.2 Operational Phase

The Proposed Development and all permitted developments considered are required to engage with Uisce Éireann, ESB Networks, EIR and Enet to ensure that there is sufficient capacity to cater for the increase in water, wastewater, electricity and telecommunication requirements.

This list of developments (Chapter 2, Appendix 2.1 of this EIAR) have been reviewed all developments are capable of combining with the Proposed Development and resulting cumulative effects on material assets.

Consultations have been undertaken with Uisce Éireann and ESB Networks, and no significant supply constraints have been identified for development at this location. Further consultation will take place with subject to the grant of the planning application associated with the Proposed Development. These National Authorities in considering future connections, take into consideration the environmental impacts of planned developments within the wider network. In developing long-term plans for security of supply, these National Authorities for water and energy supply are required to develop resources in compliance with sustainable environmental planning. Therefore, the Proposed Development in combination with other exiting and permitted development is not likely to result in prolonged utility disruption; notable extra demand on a utility; or medium-term disruption to a significant piece of infrastructure. As such, there will therefore be no significant effects on material assets to the wider economy or environment.

Based on the above, it is predicted that the cumulative effects of the Proposed Development with other permitted, planned, and existing developments is, **neutral, imperceptible**, and **long-term** and during the operational phase.



RECEIVED: 28/05/2026

Chapter 16 – Interactions

TABLE OF CONTENTS

16. INTERACTIONS	16-1
16.1 Introduction.....	16-1
16.2 Population and Human Health and its interaction with:.....	16-1
16.2.1 Land, Soils and Geology:	16-1
16.2.2 Hydrology and Hydrogeology:	16-2
16.2.3 Biodiversity:	16-2
16.2.4 Air Quality:.....	16-2
16.2.5 Climate:	16-3
16.2.6 Noise and Vibration:.....	16-3
16.2.7 Townscape and Visual Impacts:.....	16-3
16.2.8 Archaeological, Architectural and Cultural Heritage:.....	16-4
16.2.9 Material Assets, including Utilities, Waste Management, and Transport:.....	16-4
16.3 Land, Soils and Geology, and its Interaction with:	16-5
16.3.1 Hydrology and Hydrogeology	16-5
16.3.2 Biodiversity.....	16-5
16.3.3 Air Quality	16-5
16.3.4 Climate	16-6
16.3.5 Noise and Vibration	16-6
16.3.6 Townscape and Visual Impacts.....	16-6
16.3.7 Archaeological, Architectural and Cultural Heritage	16-6
16.3.8 Material Assets, including Utilities, Waste Management and Transport.....	16-7
16.4 Hydrology and Hydrogeology, and its Interaction with:.....	16-7
16.4.1 Biodiversity.....	16-7
16.4.2 Air Quality	16-7
16.4.3 Climate	16-8
16.4.4 Noise and Vibration	16-8
16.4.5 Townscape and Visual Impacts.....	16-8
16.4.6 Archaeological, Architectural and Cultural Heritage	16-8
16.4.7 Material Assets, including Utilities, Waste Management and Transport.....	16-8
16.5 Biodiversity and its Interaction with:.....	16-9
16.5.1 Air Quality	16-9
16.5.2 Climate	16-9
16.5.3 Noise and Vibration	16-9
16.5.4 Townscape and Visual Impact	16-10
16.5.5 Archaeological, Architectural and Cultural Heritage	16-10
16.5.6 Material Assets, including Utilities, Waste Management and Transport.....	16-10
16.6 Air Quality, and its Interaction with:.....	16-11
16.6.1 Climate	16-11
16.6.2 Noise and Vibration	16-11
16.6.3 Townscape and Visual Impacts.....	16-11
16.6.4 Archaeological, Architectural and Cultural Heritage	16-11
16.6.5 Material Assets, including Utilities, Waste Management and Transport.....	16-12
16.7 Climate, and its Interaction with:	16-12
16.7.1 Material Assets, including Utilities, Waste Management and Transport.....	16-12
16.8 Noise and Vibration, and its Interaction with:	16-13
16.8.1 Townscape and Visual Impacts.....	16-13
16.8.2 Archaeological, Architectural, and Cultural Heritage	16-13
16.8.3 Material Assets, including Utilities, Waste, Traffic and Transportation	16-13
16.9 Townscape and Visual Impacts, and its Interaction with:.....	16-14
16.9.1 Archaeological, Architectural and Cultural Heritage.....	16-14

16.9.2	Material Assets, including Utilities, Waste Management and Transport.....	16-14
16.10	Archaeological, Architectural and Cultural Heritage, and its Interaction with:	
	16-14	
16.10.1	Material Assets, including Utilities, Waste Management and Transport.....	16-14
16.11	Interactions between Material Assets, including: Utilities, Waste Management, and Transport	16-14
16.12	Summary	16-15
16.13	Table of Interactions	16-16

LIST OF TABLES

Table 16.1 Summary of Interrelationships between the Aspects

16-16

RECEIVED: 28/05/2026

16. INTERACTIONS

16.1 Introduction

This chapter of the EIAR identifies, describes and assesses the potential interactions and inter-relationships between the environmental factors addressed in the preceding chapters, for both the construction and operational phases of the Proposed Development.

Directive 2011/92/EU, as amended by Directive 2014/52/EU, and section 171A of the Planning and Development Act, as amended, both provide that an EIA shall identify, describe and assess in an appropriate manner, in the light of each individual case, the interaction between the following factors:

- ▶ human beings, fauna and flora, population and human health;
- ▶ biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC;
- ▶ land, soil, water, air and climate and landscape; and
- ▶ material assets, cultural heritage and the landscape.

This chapter has been produced following the requirements of the EIA Directive and Planning and Development Act 2000, as amended. The contents of the chapter have been prepared following European Commission 'Guidance on Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report' (2017) and the draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022).

The quality, magnitude and duration of potential impacts are defined in accordance with the criteria provided in the EPA 2022 Guidance as outlined in Chapter 1 (Introduction). This section of the assessment presents a summary and assessment of the identified interactions.

16.2 Population and Human Health and its interaction with:

16.2.1 Land, Soils and Geology:

16.2.1.1 Construction Phase

A reduction in soil quality via unmitigated pollutants entering the soil has the potential to lead to negative impacts on human health during construction. Hydrocarbons and petroleum products for example have a risk for humans by inhaling the fumes/dust from contaminated soil. Depending on the type of contaminant and the level of exposure, soil contamination can have serious health implications. Any potentially contaminated soils encountered will be tested and classified as hazardous or non-hazardous in accordance with the EPA *Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous* publication, HazWasteOnline tool or similar approved method.

Taking into account the design and mitigation measures set out in Chapter 5 of this EIAR, there is no potential for negative interactions between Human Health and Populations, and Land, Soils and Geology during the construction phase. The interaction is considered to be **neutral, imperceptible** and **short term**.

16.2.1.2 Operational Phase

There are no potentially significant interactions identified between Human Health and Populations, and Land, Soils and Geology during the operational phase.

16.2.2 Hydrology and Hydrogeology:

16.2.2.1 Construction Phase

The construction phase of the Proposed Development has the potential (without mitigation) to impact on the water quality via unmitigated pollutants entering the onsite drainage system and migrating towards the Groody River and Shannon River (Lower). As there are no source pathway linkages to any water supplies or bathing/recreational waters there is no potential for a human health impact, and therefore no interactions.

16.2.2.2 Operational Phase

Given the proposed design and drainage infrastructure, there is no potential for unmitigated offsite flooding arising from the increased hardstanding areas, as operational runoff will be managed and attenuated through the proposed drainage design and SuDS measures.

There is also no potential for offsite contamination from car parking or trafficked areas, including hydrocarbons, as all runoff from these areas will be intercepted, treated, and attenuated within the integrated SuDS network (e.g. permeable paving, bioretention areas, swales, attenuation pond) prior to entering the controlled drainage system.

There are no recorded recreational waters, bathing water bodies, or surface water abstraction points located downstream of or directly hydrologically connected to the site that could be impacted by changes in water quality or flow. In addition, the Geological Survey Ireland (GSI) records no Public Supply Source Protection Areas or Group Scheme Preliminary Source Protection Areas within the zone of influence of the Proposed Development.

As a result, there are no identifiable pathways linking the development to receptors used for drinking water supply, recreation, or other human uses. Consequently, no significant impacts on human health or local populations are anticipated during the operational phase, and therefore no interactions.

16.2.3 Biodiversity:

16.2.3.1 Construction Phase

There are no potentially significant interactions identified between Population and Human Health, and Biodiversity during the construction phase.

16.2.3.2 Operational Phase

There are no potentially significant interactions identified between Population and Human Health, and Biodiversity during the operational phase.

16.2.4 Air Quality:

16.2.4.1 Construction Phase

An adverse air quality impact during the construction phase can cause health and dust nuisance issues. There is a low risk of dust-related human health impacts during the construction phase of the Proposed Development. Best practice mitigation measures will be implemented during the construction phase to ensure that the impact of the Proposed Development complies with all ambient air quality legislative limits. Therefore, the predicted impact is **short-term, negative, localised** and **not significant** with respect to Population and Human Health during the construction phase.

16.2.4.2 Operational Phase

Vehicles accessing the site will emit pollutants which may impact Air Quality and Human Health. However, the increased number of vehicles associated with the Proposed Development will not cause a significant change in air pollutant emissions in the locality. It has been assessed that emissions will be in compliance with the ambient air quality standards which are set for the protection of human health. Impacts will be **short-term, localised, neutral** and **not significant**.

16.2.5 Climate:

16.2.5.1 Construction Phase

There are no potentially significant interactions identified between climate, and human health during the construction phase.

16.2.5.2 Operational Phase

There are no potentially significant interactions identified between climate, and human health during the operational phase.

16.2.6 Noise and Vibration:

16.2.6.1 Construction Phase

As detailed in Chapter 10 (Noise and Vibration), there will be some impact on nearby noise sensitive receptors during construction, due to noise emissions from site activity, traffic, and other activities. The application of noise and vibration limits and limits on the hours of operation, along with implementation of appropriate noise and vibration control measures, will ensure that noise and vibration impact is kept to a minimum.

Taking into account the design and mitigation measures set out in Chapter 10 of this EIAR, there is potential for negative interaction between Human Health and Populations, and Noise and Vibration during the construction phase. The interaction is considered to be **short-term, negative** and **not significant** at the nearest sensitive receptors.

16.2.6.2 Operational Phase

Once the operational noise levels are controlled to the limit values set out in Chapter 10, there are no expected impacts to sleep disturbance from operational noise sources.

The expected health effect due to noise from the proposed development is **neutral, not significant** and **long-term**.

16.2.7 Townscape and Visual Impacts:

16.2.7.1 Construction Phase

Taking into account the existing sensitivities of the site and the design and the best-practice construction measures set out in Chapter 11 (Townscape and Visual Impact) of this EIAR, there is a potential for effects upon the visual experience of people in the area during the construction phase. The interaction is considered to be at most **negative, moderate** and **short term**, with effects reduced over greater distance from the site and outside of peak construction works.

16.2.7.2 Operational Phase

Whilst the incoming development is notable in scale, it is expected to result in a positive transformation of the site. While some localised and moderate visual impacts will occur, these are limited in extent and are balanced by the long-term benefits of regenerating a prominent brownfield site and enhancing the character and identity of this important gateway location. Overall, the interaction is considered to be **positive, moderate** and **permanent**.

16.2.8 Archaeological, Architectural and Cultural Heritage:

16.2.8.1 Construction Phase

There are no potentially significant interactions identified between Population and Human Health, and Archaeological, Architectural and Cultural Heritage during the construction phase.

16.2.8.2 Operational Phase

There are no potentially significant interactions identified between Population and Human Health, and Archaeological, Architectural and Cultural Heritage during the operational phase.

16.2.9 Material Assets, including Utilities, Waste Management, and Transport:

16.2.9.1 Construction Phase

Construction phase impacts to human health as a result of waste are primarily associated the indirect effect of litter issues resulting in increase in vermin. Mismanagement of demolition and soil material can potentially lead to air / dust impacts. There are also potential risks to human health associated with accidents when handling and transporting earthworks and wastes. Removal of waste from the construction works will generate temporary increased traffic levels. With increased traffic movements and reduced engine efficiency, i.e., due to congestion, the emissions of vehicles increase.

The individual chapters of this EIAR Chapters 13, 14, and 15 (Material Assets - Traffic and Transportation, Waste Management and Utilities) have assessed the capacities of the available infrastructure to accommodate the Proposed Development and the implementation of the mitigation measure proposed in these chapters will ensure there are no residual negative impacts on the local population.

Taking into account the design and mitigation measures set out in Chapters 13, 14, and 15 (Material Assets - Traffic and Transportation, Waste Management and Utilities) of this EIAR, there is no potential for negative interaction between Human Health and Populations, and Material Assets during the construction phase. The interaction is considered to be **neutral, slight**, and **short-term**.

16.2.9.2 Operational Phase

Similar risks to those described above for the construction phase associated with improper waste management during the operational phase could lead to litter and associated vermin. There is the potential risks when waste contractors use waste equipment or move waste receptacles improperly.

As outlined in Chapters 8, 10 and 13 (Air Quality, Noise & Vibration and Material Assets - Traffic and Transportation), the level of traffic increase is not likely to have any adverse transport-related environmental effects in terms of potential for air quality, noise or vibrations, etc.

A carefully planned approach to waste management, and the mitigation measures in Chapters 13 and 14, will ensure appropriate management of waste and avoid any negative impacts on the local population. The effects should be **long-term, imperceptible** and **neutral**.

16.3 Land, Soils and Geology, and its Interaction with:

16.3.1 Hydrology and Hydrogeology

16.3.1.1 Construction Phase

The construction phase of the proposed development has the potential for contaminated run-off from accidental leakages, increased sediment runoff and discharges to ground which has the potential to result in a local impact on soil quality, which could then migrate to the groundwater underlying the site. However, the groundwater flow paths are assessed to be generally local and the potential for offsite migration of contaminants is considered to be low. The proposed construction phase mitigation outlined in Section 6.6 - Chapter 6 (Hydrology and Hydrogeology) of this EIAR, means that the Proposed Development will not result in significant negative impact on groundwater and surface water quality in the local area.

Taking into account the design and mitigation measures set out in Chapter 5 (Land, Soils and Geology) and Chapter 6 (Hydrology and Hydrogeology) of this EIAR, there is potential for neutral interaction between Land, Soils and Geology, and Hydrology and Hydrogeology during the construction phase. The interaction is considered to be **neutral, imperceptible, and short term.**

16.3.1.2 Operational Phase

During operation the majority of the site will be capped by hardstand/building and a drainage system will be installed which features SuDs design measures. Therefore, there is no potential for accidental discharges to ground to contaminate the local soils and underlying aquifer. The interaction is considered to be **neutral, imperceptible, and long term.**

16.3.2 Biodiversity

16.3.2.1 Construction Phase

In the absence of mitigation, there is potential for silt laden material or pollution to enter nearby surface waterbodies (and impact on local biodiversity and European sites downstream from the works). Furthermore, dust emissions from exposed earthworks have the potential to settle on plants causing impacts to local ecology.

Taking into account the design and mitigation measures set out in Chapters 5 (Land, Soils and Geology) and 7 (Biodiversity) of this EIAR, there is potential for neutral interaction between Land, Soil and Geology, and Biodiversity during the construction phase. The interaction is considered to be **neutral, imperceptible and short term.**

16.3.2.2 Operational Phase

There are no potentially significant interactions identified between Land, Soils and Geology, and Biodiversity during the operational phase.

16.3.3 Air Quality

16.3.3.1 Construction Phase

Construction phase activities such as land clearing, excavations and stockpiling of materials etc. have the potential for interactions between air quality and the land, soils and geological environment in the form of dust emissions. Mitigation measures are proposed in Chapter 8 (Air Quality) to prevent fugitive dust emissions from construction activities including excavation of soils.

Taking into account the design and mitigation measures set out in this EIAR, there is potential for neutral interaction between Land, Soils and Geology, and Air Quality during the construction phase. The interaction is considered to be **neutral, imperceptible, and short term.**

16.3.3.2 Operational Phase

There are no potentially significant interactions identified between Air Quality, and Land & Soils during the operational phase.

16.3.4 Climate

16.3.4.1 Construction Phase

There are no potentially significant interactions identified between Land, Soils and Geology, and Climate during the construction phase.

16.3.4.2 Operational Phase

There are no potentially significant interactions identified between Land, Soils and Geology, and Climate during the operational phase.

16.3.5 Noise and Vibration

16.3.5.1 Construction Phase

There are no potentially significant interactions identified between Land, Soils and Geology, and Noise and Vibration during the construction phase.

16.3.5.2 Operational Phase

There are no potentially significant interactions identified between Land, Soils and Geology, and Noise and Vibration during the operational phase.

16.3.6 Townscape and Visual Impacts

16.3.6.1 Construction Phase

There are no potentially significant interactions identified between Land, Soils and Geology, and Townscape and Visual Impacts during the construction phase.

16.3.6.2 Operational Phase

There are no potentially significant interactions identified between Land, Soils and Geology, and Townscape and Visual Impacts during the operational phase.

16.3.7 Archaeological, Architectural and Cultural Heritage

16.3.7.1 Construction Phase

There are no potentially significant interactions identified between Land, Soils and Geology, and Archaeological, Architectural and Cultural Heritage during the construction phase.

16.3.7.2 Operational Phase

There are no potentially significant interactions identified between Land, Soils and Geology, and Archaeological, Architectural and Cultural Heritage during the operational phase.

16.3.8 Material Assets, including Utilities, Waste Management and Transport

16.3.8.1 Construction Phase

During the construction phase, excavated soil, stone and clay will be generated from the excavations required to facilitate site levelling, construction of new foundations and the installations of site services. It is envisaged that some of the excavated material will need to be removed off-site. When material has to be taken off-site, it will be taken for reuse or recovery, where practical, with disposal as a last resort. Adherence to the mitigation measures in Chapter 5 (Land Soils, and Geology), Chapter 14 (Material Assets – Waste Management), and the requirements of the RWMP (Appendix 14.1), will ensure the effect is **long-term, imperceptible** and **neutral**.

16.3.8.2 Operational Phase

There are no potentially significant interactions identified between Land, Soils and Geology, and Material Assets during the operational phase.

16.4 Hydrology and Hydrogeology, and its Interaction with:

16.4.1 Biodiversity

16.4.1.1 Construction Phase

In the absence of mitigation, surface water run-off during the construction phase may contain increased silt levels or otherwise become polluted from accidental spillages. Suspended solids in runoff water may result in an increase in suspended sediment load, resulting in increased turbidity, which may impact on the underlying groundwater quality and downstream water quality and habitats. Furthermore, dust emissions from exposed earthworks have the potential to settle on plants causing impacts to local ecology.

Taking into account the design and mitigation measures set out in this EIAR, there is a negligible negative interaction between hydrology and hydrogeology, and biodiversity during the construction phase. The interaction is considered to be **negative, imperceptible**, and **short term**.

16.4.1.2 Operational Phase

To ensure runoff is properly managed and does not exceed pre-development conditions, the proposed drainage system incorporates a suite of Sustainable Drainage Systems (SuDS) and attenuation features. These measures regulate, treat, and attenuate flows before discharge. Overall, with the proposed SuDS measures, attenuation systems, and the fact that the site is already predominantly hardstanding / made ground, no significant operational impacts on surface water or groundwater flow or quantity that would result in a negative interaction with Biodiversity are anticipated. The interaction is considered to be **neutral, imperceptible** and **long term**.

16.4.2 Air Quality

16.4.2.1 Construction Phase

Construction phase activities such as land clearing, excavations, stockpiling of materials etc. have the potential for interactions between air quality and hydrology and hydrogeology, in the form of dust emissions that may deposit in surface waters. With the appropriate mitigation measures to prevent fugitive dust emissions, it is predicted that there will be no significant interactions between air quality and hydrology and hydrogeology. The interaction is considered to be **negative, not significant** and **short term**.

16.4.2.2 Operational Phase

There are no potentially significant interactions identified between air quality, and hydrology and hydrogeology during the operational phase.

16.4.3 Climate

The impact of flood risk has been assessed, and the surface water drainage network will be designed and upgraded to cater for increased rainfall in future years as a result of climate change in accordance with the Greater Dublin Drainage Study. Further, SuDS and FFL will protect the Proposed Development from the already low risk of fluvial flooding. The effect of the interactions between climate and hydrology are **direct, short-term, neutral** and **imperceptible** during the construction phase and **direct, long-term, neutral** and **imperceptible** during the operational phase, which is overall **not significant** in EIA terms.

16.4.4 Noise and Vibration

16.4.4.1 Construction Phase

There are no potentially significant interactions identified between Hydrology and Hydrogeology, and Noise and Vibration during the construction phase.

16.4.4.2 Operational Phase

There are no potentially significant interactions identified between Hydrology and Hydrogeology, and Noise and Vibration during the operational phase.

16.4.5 Townscape and Visual Impacts

16.4.5.1 Construction Phase

There are no potentially significant interactions identified between Hydrology and Hydrogeology, and Townscape and Visual Impacts during the construction phase.

16.4.5.2 Operational Phase

There are no potentially significant interactions identified between Hydrology and Hydrogeology, and Townscape and Visual Impacts during the operational phase.

16.4.6 Archaeological, Architectural and Cultural Heritage

16.4.6.1 Construction Phase

There are no potentially significant interactions identified between Hydrology and Hydrogeology, and Archaeological, Architectural and Cultural Heritage during the construction phase.

16.4.6.2 Operational Phase

There are no potentially significant interactions identified between Hydrology and Hydrogeology, and Archaeological, Architectural and Cultural Heritage during the operational phase.

16.4.7 Material Assets, including Utilities, Waste Management and Transport

16.4.7.1 Construction Phase

There are no potentially significant interactions identified between Hydrology and Hydrogeology and Material Assets, including Utilities, Waste and Transport during the construction phase of the Proposed Development.

16.4.7.2 Operational Phase

There are no potentially significant interactions identified between Hydrology and Hydrogeology, and Material Assets including Utilities, Waste and Transport during the operational phase.

16.5 Biodiversity and its Interaction with:

16.5.1 Air Quality

16.5.1.1 Construction Phase

Dust generation can occur during extended dry weather periods due to construction traffic along haul routes and construction activities such as excavations and infilling works. Dust emissions can coat vegetation leading to a reduction in the photosynthesising ability as well as other effects. There are no European sites or nationally designated sites within 250 m of the Proposed Development site area. Significant dust impacts are not predicted beyond this distance. Dust mitigation measures will be implemented on site as set out in Section Error! Reference source not found.. With the implementation of these mitigation measures dust emissions will be minimised and impacts will be **short-term, negative, localised** and **not significant** with respect to biodiversity.

16.5.1.2 Operational Phase

There are no potentially significant interactions identified between Air Quality, and Biodiversity during the operational phase.

16.5.2 Climate

16.5.2.1 Construction Phase

There are no potentially significant interactions identified between Biodiversity and Climate during the construction phase.

16.5.2.2 Operational Phase

There are no potentially significant interactions identified between Biodiversity and Climate during the operational phase.

16.5.3 Noise and Vibration

16.5.3.1 Construction Phase

There is potential for construction noise and vibration to impact on fauna during construction, primarily through temporary disturbance and displacement effects. With the implementation of mitigation measures as set out in Chapter 7 (Biodiversity) and Chapter 10 (Noise and Vibration) of the EIAR, including the application of best practice construction management, restricted working hours, and adherence to defined noise limits, noise and vibration emissions will be minimised as far as reasonably practicable.

Given the short-term and temporary nature of the construction phase, and the predicted slight to moderate noise effects, any resultant impacts on biodiversity will be temporary and reversible. Accordingly, the interaction is considered to be **negative, short-term**, and **not significant**.

16.5.3.2 Operational Phase

During the operational phase there is potential for noise effects arising from additional traffic movements and mechanical and electrical plant associated with the proposed residential development.

The noise assessment has determined that increases in traffic noise on the surrounding road network will be imperceptible and therefore will not result in any meaningful change to the existing acoustic environment. In addition, all mechanical and electrical plant will be designed to comply with the noise criteria set out in Chapter 10 (Noise and Vibration), ensuring that operational noise levels remain within established daytime and night-time limits at the nearest sensitive receptors.

As a result, no disturbance or displacement effects on fauna are anticipated. Following implementation of these measures, the interaction is considered to be **neutral, imperceptible, and long-term.**

16.5.4 Townscape and Visual Impact

16.5.4.1 Construction Phase

The construction phase site clearance works will result in permanent changes to the landscape with some loss of local biodiversity.

Taking into account the design and mitigation measures set out in Chapter 7 and 11 of this EIAR, the interaction is considered to be **negative, not significant and short term.**

16.5.4.2 Operational Phase

A Landscape Plan has been prepared to increase Biodiversity where possible. This involves saving native tree saplings for future planting, maintaining 'rough or scrub' areas for encouraging biodiversity and planting native and wildflower areas where feasible. Management includes appropriate seasonal vegetation cutting, replanting saplings to replace hedges, rough and grassy verges allowing unmanaged verges to develop natural wildflower components. The Landscape Plan has been prepared in consultation with this EIAR to incorporate elements of the existing environment, consider loss and apply appropriate mitigation with sustainable planting of replacement woodland, scrub and linear features in particular with native species of local type and provenance to enhance biodiversity. The interaction is considered to be **long term and positive.**

16.5.5 Archaeological, Architectural and Cultural Heritage

16.5.5.1 Construction Phase

There are no potentially significant interactions identified between Biodiversity, and Archaeological, Architectural and Cultural Heritage during the construction phase.

16.5.5.2 Operational Phase

There are no potentially significant interactions identified between Biodiversity, and Archaeological, Architectural and Cultural Heritage during the operational phase.

16.5.6 Material Assets, including Utilities, Waste Management and Transport

16.5.6.1 Construction Phase

There are no potentially significant interactions identified between Biodiversity, and Material Assets (Traffic and Transportation, Waste Management and Utilities) during the construction phase.

Improper management of construction waste could cause littering, pollution or vermin potentially affecting nearby habitats or faunal species. Mitigation measures in Chapter 14 (Material Assets – Waste Management) and Chapter 7 (Biodiversity) will ensure these risks are minimised. Following mitigation, the effects are expected to be **short-term, imperceptible and neutral.**

16.5.6.2 Operational Phase

There are no potentially significant interactions identified between Biodiversity, and Material Assets (Traffic and Transportation, Waste Management and Utilities during the operational phase.

Operational waste will be managed through segregation and secure covered storage to prevent litter, pollution or pest attraction. Following mitigation, the effects are expected to be **long-term, imperceptible** and **neutral**.

16.6 Air Quality, and its Interaction with:

16.6.1 Climate

Air Quality and Climate have the potential to interact with a number of environmental attributes.

Air Quality and Climate have interactions as the emissions from the burning of fossil fuels and Hydrotreated Vegetable Oil (HVO) during the construction and operational phases generate both air quality and climate impacts. While the sources of impacts on air quality and climate are strongly linked, there is no impact on climate due to air quality in the context of this assessment.

Problems associated with climate change, such as hotter, drier summers, can often exacerbate the problems associated with poor air quality, and therefore the effect of the interactions between climate and air quality are **direct, long-term, negative** and **imperceptible** during the construction phase and **direct, long-term, negative** and **imperceptible** during the operational phase, which is overall **not significant** in EIA terms.

16.6.2 Noise and Vibration

16.6.2.1 Construction Phase

There are no potentially significant interactions identified between Air Quality and Noise and Vibration during the construction phase.

16.6.2.2 Operational Phase

There are no potentially significant interactions identified between Air Quality and Noise and Vibration during the operational phase.

16.6.3 Townscape and Visual Impacts

16.6.3.1 Construction Phase

There are no potentially significant interactions identified between Air Quality and Townscape and Visual during the construction phase.

16.6.3.2 Operational Phase

There are no potentially significant interactions identified between Air Quality and Townscape and Visual during the operational phase.

16.6.4 Archaeological, Architectural and Cultural Heritage

16.6.4.1 Construction Phase

There are no potentially significant interactions identified between Air Quality and Archaeological, Architectural and Cultural Heritage during the construction phase.

16.6.4.2 Operational Phase

There are no potentially significant interactions identified between Air Quality and Archaeological, Architectural and Cultural Heritage during the operational phase.

16.6.5 Material Assets, including Utilities, Waste Management and Transport

16.6.5.1 Construction Phase

Interactions between Air Quality and Traffic can be significant. With increased traffic movements and reduced engine efficiency, i.e. due to congestion, the emissions of vehicles increase. The impacts of the Proposed Development on air quality are assessed by reviewing the change in annual average daily traffic on roads close to the site. In this assessment, the impact of the interactions between Traffic and Air Quality are linked but there is no potential for significant impacts from traffic on air quality. The effects are considered to be **short-term, negative, localised** and **not significant** during the construction phase.

16.6.5.2 Operational Phase

Taking into account the design and mitigation measures set out in Chapter 8 (Air Quality) and Chapter 13 (Traffic and Transportation) of this EIA, there remains a residual neutral interaction between Traffic, and Air Quality during the operational phase. As there are very few traffic movements associated with the operational development, the impact of the interactions between Traffic and Air Quality are considered to be **long-term, direct, neutral** and **not significant** during the operational phase.

16.7 Climate, and its Interaction with:

16.7.1 Material Assets, including Utilities, Waste Management and Transport

16.7.1.1 Construction Phase

Waste management measures will be put in place to minimise the amount of waste entering landfill, which has higher associated embodied carbon emissions than other waste management such as recycling. The RWMP (Appendix 14.1) prioritises reuse, recycling, and recovery of materials, which will reduce the volume of waste sent to landfill and associated emissions. The effect of the interactions between waste and climate are considered to be **direct, long-term, neutral** and **imperceptible** during the construction, which is overall **not significant** in EIA terms.

During the construction there is the potential for interactions between climate and traffic as vehicles accessing the site will result in GHG emissions. However, as set out in the Traffic Chapter (Chapter 13) and Air Quality Chapter (Chapter 8) the Proposed Development is not expected to result in an increase in traffic compared to the baseline. The effects of the interactions between traffic and transport and climate are therefore considered to be **direct, long-term, neutral** and **not significant** during the construction phase.

16.7.1.2 Operational Phase

Potential interactions between Traffic and Climate during operational phase are a result of the increased traffic levels which lead to increased GHG emissions. The traffic assessments resulted in a slight increase in traffic levels for operational phase of Proposed Development, with interactions between Traffic and Climate are considered to be **long-term, neutral** and **not significant**.

The OWMP (Appendix 14.2) will promote recycling and minimise residual waste during operation, reducing indirect emissions from waste transport and disposal. The effect of the interactions between waste and

climate are considered to be **direct, long-term, neutral** and **imperceptible** during the operational phase, which is overall **not significant** in EIA terms.

16.8 Noise and Vibration, and its Interaction with:

16.8.1 Townscape and Visual Impacts

16.8.1.1 Construction Phase

There are no potentially significant interactions identified between Noise and Vibration, and Townscape and Visual Impacts, during the construction phase.

16.8.1.2 Operational Phase

There are no potentially significant interactions identified between Noise and Vibration, and Townscape and Visual Impacts, during the operational phase.

16.8.2 Archaeological, Architectural, and Cultural Heritage

16.8.2.1 Construction Phase

There are no potentially significant interactions identified between Noise and Vibration, and Archaeological, Architectural and Cultural Heritage during the construction phase.

16.8.2.2 Operational Phase

There are no potentially significant interactions identified between Noise and Vibration, and Archaeological, Architectural and Cultural Heritage during the operational phase.

16.8.3 Material Assets, including Utilities, Waste, Traffic and Transportation

16.8.3.1 Construction Phase

During the construction phase of the proposed development, construction traffic will use public roads and there will be a corresponding increase in traffic noise levels. In order to increase traffic noise levels by 1 dB traffic volumes would need to increase by the order of 25%, it is considered that additional traffic introduced onto the local road network due to the construction phase associated with various phases of the development will not result in a significant noise impact.

Predicted increases in traffic noise levels are such that the resultant noise effects are **negative, not significant** and **short-term**.

16.8.3.2 Operational Phase

The predicted increase in noise levels due to additional traffic is expected to be imperceptible along the existing road network. Within the context of the current noise environment, the overall contribution from induced traffic is considered **neutral, imperceptible**, and **long-term** in duration at nearby residential locations.

16.9 Townscape and Visual Impacts, and its Interaction with:

16.9.1 Archaeological, Architectural and Cultural Heritage

16.9.1.1 Construction Phase

There are no potentially significant interactions identified between Townscape and Visual Impacts, and Archaeological, Architectural and Cultural Heritage during the construction phase.

16.9.1.2 Operational Phase

There are no potentially significant interactions identified between Townscape and Visual Impacts, and Archaeological, Architectural and Cultural Heritage during the operational phase.

16.9.2 Material Assets, including Utilities, Waste Management and Transport

16.9.2.1 Construction Phase

There are no potentially significant interactions identified between Townscape and Visual Impacts, and Material Assets during the construction phase.

16.9.2.2 Operational Phase

There are no potentially significant interactions identified between Townscape and Visual Impacts, and Material Assets during the operational phase.

16.10 Archaeological, Architectural and Cultural Heritage, and its Interaction with:

16.10.1 Material Assets, including Utilities, Waste Management and Transport

16.10.1.1 Construction Phase

There are no potentially significant interactions identified between Material Assets, and Archaeological, Architectural and Cultural Heritage during the construction phase.

16.10.1.2 Operational Phase

There are no potentially significant interactions identified between Material Assets, and Archaeological, Architectural and Cultural Heritage during the operational phase.

16.11 Interactions between Material Assets, including: Utilities, Waste Management, and Transport

16.11.1.1 Construction Phase

Removal of waste from the construction works will generate temporary increased traffic levels. The impact, however, will be imperceptible in the context of the overall traffic and transportation increase. A waste management strategy is proposed in the Resource and Waste Management Plan (RWMP) and Chapter 14 (Waste Management) of this EIA. The proposed waste management strategy promotes site reuse and recycling of waste, minimising the number of vehicle movements for waste removal. Adherence to the mitigation measures in this chapter, Chapter 14 (Waste Management), and the requirements of the RWMP (Appendix 14.1), will ensure the effect is **short-term, imperceptible and neutral**.

16.11.1.2 Operational Phase

During the operational phase, there will be an increase in vehicle movements as a result of operational waste collections. The impact, however, will be imperceptible in the context of the overall traffic and transportation increase. Traffic-related impacts operational phase is addressed in Chapter 13 (Material Assets – Traffic and Transportation) of this EIAR. Provided the mitigation measures detailed in this chapter and Chapter 14 are adhered to, the predicted effects are **long-term, imperceptible** and **neutral**.

16.12 Summary

In summary, the interactions between the environmental factors and impacts discussed in this EIAR have been assessed and the majority of interactions are neutral or negative interactions. Negative interactions are generally associated with the construction phase and will be short term in nature. There are some long-term positive interactions associated with the operation of the Proposed Development.

The reasoning behind the conclusion that certain interactions are considered to have a positive, neutral or negative effect is outlined in this Chapter. A summary of the potential interactions is presented in Table 16.1 below.

16.13 Table of Interactions

Table 16.1 Summary of Interrelationships between the Aspects

	Population & Human Health		Land, Soils & Geology		Hydrology & Hydrogeology		Biodiversity		Air Quality		Climate		Noise & Vibration		Townscape & Visual Impact		Archaeological Architectural & Cultural Heritage		Material Assets (including Transport & Waste)													
	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.												
Population & Human Health			o	X	X	X	X	X	—	o	X	X	—	o	—	+	X	X	o	o												
Land, Soils & Geology					o	o	o	X	o	X	X	X	X	X	X	X	X	X	o	X												
Hydrology & Hydrogeology							—	o	—	X	o	o	X	X	X	X	X	X	X	X												
Biodiversity									—	X	X	X	—	o	—	+	X	X	o	o												
Air Quality											—	—	X	X	X	X	X	X	—	o												
Climate													X	X	X	X	X	X	o	o												
Noise & Vibration															X	X	X	X	—	o												
Townscape & Visual Impact																	X	X	X	X												
Archaeological Architectural and Cultural Heritage																			X	X												
Material Assets (including Transport & Waste)																			o	o												
	<table><tr><td>Con.</td><td>Construction Phase</td></tr><tr><td>Op.</td><td>Operational Phase</td></tr><tr><td>X</td><td>No Interaction</td></tr></table><table><tr><td>+</td><td>Positive Interaction</td></tr><tr><td>o</td><td>Neutral Interaction</td></tr><tr><td>—</td><td>Negative Interaction</td></tr></table>																				Con.	Construction Phase	Op.	Operational Phase	X	No Interaction	+	Positive Interaction	o	Neutral Interaction	—	Negative Interaction
Con.	Construction Phase																															
Op.	Operational Phase																															
X	No Interaction																															
+	Positive Interaction																															
o	Neutral Interaction																															
—	Negative Interaction																															

RECEIVED: 28/05/2026