N25 Little Island Pedestrian and Cyclist Bridge
Environmental Impact Assessment Report

Chapter 10
Noise and Vibration

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10. Noise and Vibration

10.1 Introduction

This chapter assesses the potential significant impacts on noise and vibration resulting from the construction, operation and decommissioning of the Proposed Development.

The assessment includes an assessment of construction noise and vibration emissions and considers the likely significant impacts on the noise and vibration environment as a result of the operation and decommissioning of the Proposed Development.

10.2 Methodology

10.2.1 Study area

The study area that has been considered for the noise and vibration assessment encompasses the Proposed Development and nearby sensitive receptors that may be affected during construction, operation and decommissioning of the Proposed Development.

The locations of the Proposed Development and nearby sensitive receptors are illustrated in **Image 10.1**.

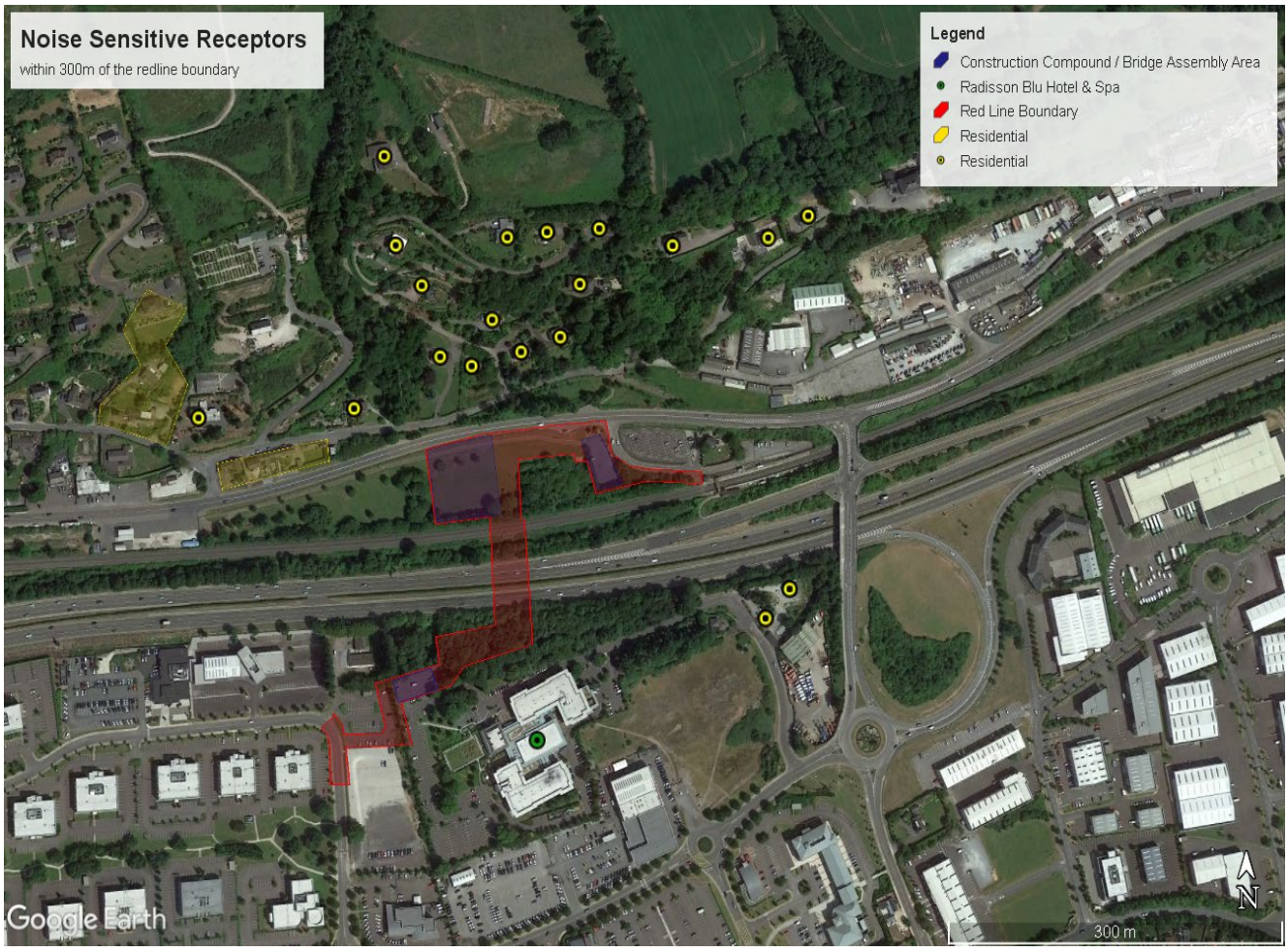

Image 10.1: Sensitive receptors within 300m of the redline boundary. Source: Google Earth.

10.2.2 Guidance and legislation

Guidance and legislation of relevance to this assessment are outlined below.

The National Planning Framework 2040 (2018)

The National Planning Framework (NPF) (GoI, 2018) is the Irish Government's high-level strategic plan for future growth and planning. This includes Policy Objective 65 which states the following with regards to noise:

"Promote the pro-active management of noise where it is likely to have significant adverse impacts on health and quality of life and support the aims of the Environmental Noise Regulations through national planning guidance and Noise Action Plans".

Environmental Protection Agency (EPA) Office of Environmental Enforcement (OEE) 'Guidance Note for Noise: Licence Applications, Survey and Assessments in Relation to Scheduled Activities' (NG4)

The EPA *'Guidance Note for Noise: Licence Applications, Survey and Assessments in Relation to Scheduled Activities'* (EPA, 2016) provides guidance for licensed sites with the assessment of their potential and actual noise impact on the local environment and sets out recommended noise limit criteria at noise sensitive locations. While the onshore 220kV substation does not fall within the NG4 schedule of activities, the noise limit criteria have been considered as relevant upper thresholds for the EIAR operational noise assessment.

Institute of Environmental Management and Assessment (IEMA) 'Guidelines for Environmental Noise Impact Assessment' (2014)

IEMA's *'Guidelines for environmental noise impact assessment'* (IEMA, 2014) provides guidelines to address the key principles of noise impact assessment and are applicable to all development proposals where noise impacts are likely to occur.

British Standard 5228:2009+A1:2014

BS 5228-1 *'Code of practice for noise and vibration control on construction and open sites. Noise'* (BSI, 2014) provides a 'best practice' guide for noise control and includes Sound Power Level (Lw) data for individual plant as well as a calculation method for noise from construction activities. BS 5228-2 *'Code of practice for noise and vibration control on construction and open sites. Vibration'* (BSI, 2014) provides comparable 'best practice' for vibration control, including guidance on the human response to vibration.

Transport Research Laboratory (TRL) Report 429 'Groundborne Vibration Caused by Mechanised Construction Works' (2000)

TRL Report 429 *'Groundborne Vibration Caused by Mechanised Construction Works'* (TRL, 2000) provides methods for predicting the environmental impact of vibration caused by the operation of mechanised construction plant.

Transport Infrastructure Ireland (TII) (previously National Roads Authority (NRA)) Guidelines for the Treatment of Noise and Vibration in National Road Schemes (TII, 2004)

The TII publication *'Guidelines for the Treatment of Noise and Vibration in National Road Schemes'* (TII, 2004) contains information on permissible construction noise and vibration levels for various hours of operation.

Good Practice Guide for the Treatment of Noise during the Planning of National Road Schemes (TII, 2014)

The TII publication *'Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes'* (TII, 2014) is based on the lessons learned from post EIA noise evaluations studies and research undertaken on the design of noise barriers. It provides advice and information for use by acousticians, and it is also relevant for traffic, motorway and pavement engineers. The advice supplements and should be read in conjunction with the original noise guidelines.

10.2.3 Assessment methodology

Information relating to the construction activities for the Proposed Development is provided in **Chapter 5**, *Construction Strategy*. This information informs the assessment of construction noise and vibration impacts. The assessment of construction impacts considers estimated noise levels at receptors and their sensitivity to noise (where relevant).

10.2.3.1 Construction noise

An assessment of the predicted construction noise is carried out based on the construction methodology and noise source levels in BS5228-1 (BSI, 2009). This is considered an appropriate method to assess construction noise prior to the appointment of a contractor and confirmation of work methods and plant / equipment to be used. The impact assessment methodology is discussed below.

There are no published statutory guidelines on noise levels from construction sites in Ireland. The construction noise assessment therefore makes reference to guidance from BS5228-1. Annex E of BS5228-1 provides example criteria for the assessment of construction noise impacts, with these presented in **Table 10.1**. These criteria have been used to assess the potential significant impacts from construction noise.

Table 10.1: BS5228-1 Construction noise categories and thresholds based on measured noise levels

Assessment category and threshold value period	Threshold value, $L_{Aeq,T}$ dB		
	Category A[A]	Category B[B]	Category C[C]
Day time (07:00 – 19:00 on weekdays, 07:00 – 13:00 on Saturdays)	65	70	75
Evening time (19:00 – 23:00 on weekdays, 13:00 – 23:00 on Saturdays, and 07:00 – 23:00 on Sundays)	55	60	65
Night-time (23:00 – 07:00 on all days)	45	50	55

A. Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5 dBA) are less than these values.

B. Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5 dBA) are the same as Category A values.

C. Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5 dBA) are higher than Category A values.

Based on the measured noise levels at nearby sensitive receptors, potential significant impacts were assessed against the threshold values presented in **Table 10.2**.

Table 10.2: BS5228-1 threshold of potential significant impacts at noise sensitive receptors (BS5228-1+A1:2014)

Time period	Day and times	Threshold value ($L_{Aeq,T}$) dB
Day	Weekdays 07:00 – 19:00 Saturday 07:00 – 13:00	65
Evening	Weekday 19:00 – 23:00 Saturday 13:00 – 23:00 Sunday 07:00 – 23:00	55
Night	All days 23:00 – 07:00	45

Although significant impacts due to construction activities may be determined through an assessment based on exceedances of the defined thresholds for construction noise, additional consideration of significance for construction activities is undertaken through a qualitative discussion of the following:

- Duration of activities
- Frequency of events; and
- Sensitivity of receptors.

Where an exceedance of the construction noise criteria, as outlined in **Table 10.2**, is predicted, the impacts associated with the noise increase is rated in accordance with **Table 10.3**.

Table 10.3: Likely impact associated with the exceedance of construction noise criteria

Extent of Noise Effect (Exceedance of Assessment Criteria)	Noise Impact Magnitude	Magnitude Rating
Less than 3 dBA	No significant change / imperceptible	Neutral to slight impact
Increase of 3 – 5 dBA	Slight increase	Slight to moderate impact
Increase of 6 – 10 dBA	Moderate increase	Moderate to major impact
Increase of more than 10 dBA	Substantial increase	Significant impact

Table 10.4 outlines the duration and frequency of effects, based on EPA Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, 2022).

Table 10.4: Duration and frequency of impacts

Impact type	Duration
Momentary impact	Impacts lasting from seconds to minutes
Brief impact	Impacts lasting less than a day
Temporary impact	Impacts lasting less than a year
Short-term impact	Impacts lasting one to seven years
Medium-term impact	Impacts lasting seven to fifteen years
Long-term impact	Impacts lasting fifteen to sixty years
Permanent impact	Impacts lasting over sixty years

10.2.3.2 Construction vibration

An assessment of the construction vibration is carried out based on information about the proposed construction methods.

BS5228-2 provides guidance on the impacts on humans from vibration. **Table 10.5** presents the PPV (peak particle velocity) vibration levels and provides a semantic scale for the description of construction vibration impacts on human receptors based on guidance in BS5228-2.

Table 10.5: BS5228-2 threshold of potential significant impact at dwellings (BS5228-2:2009+A1:2014)

PPV Level	Description
0.14 to < 0.3 mm/s	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration.
0.3 to < 1.0 mm/s	Vibration might be just perceptible in residential environments.
1.0 to < 5.0 mm/s	It is likely that vibration of this level in residential environments will cause complaint but can be tolerated if prior warning and explanation has been given to residents.
>= 5.0 mm/s	Vibration at this level is likely to be intolerable for any more than a very brief exposure.

For residential receptors and other medium sensitivity receptors, a negative impact has been defined as a PPV of 0.3 mm/s or higher during the daytime. The onset of a significant negative impact has been defined as a PPV of 1.0 mm/s or higher in the daytime. It is likely that residential receptors are more sensitive to vibration at night and therefore significant negative impact is likely to occur at a PPV of 0.3 mm/s or higher during the night-time periods.

In addition to human annoyance, building structures may be damaged by high levels of vibration. The levels of vibration that may cause building damage are far in excess of those that may cause annoyance. Consequently, if vibration levels are controlled to those specified for human annoyance (i.e., 1.0 mm/s) then it is highly unlikely that buildings will be damaged by construction vibration.

10.2.3.3 Traffic volumes (Construction and Operation)

The TII *Guidelines for the Treatment of Noise and Vibration in National Road Schemes* (TII, 2004) state increases in Annual Average Daily Traffic (AADT) flows of less than 25% during the Construction and Operational Phases are unlikely to result in significant noise and vibration effects.

No routes are expected to experience increases in daily traffic of greater than 25% – refer to **Chapter 7**, *Traffic and Transportation* for further details. Therefore, there is no requirement for a detailed assessment.

10.3 Baseline Environment

A baseline environmental noise survey was conducted nearby the Proposed Development to quantify the existing noise environment in the vicinity of the noise sensitive receptors that may be affected by the Proposed Development. The survey was carried out on a weekday and during time periods which were selected to provide a typical snapshot of the existing baseline noise environment.

A baseline survey of vibration along the Proposed Development was not undertaken as existing levels in the vicinity of the Proposed Development are not expected to be of a sufficient magnitude to cause disturbance to people or structural damage to property. Furthermore, vibration was not perceptible at any of the noise survey locations during the baseline environmental noise survey.

10.3.1 Survey periods

An attended baseline environmental noise survey was conducted at three locations on 25th July 2023 between 12:00 and 16:30hrs.

10.3.2 Measurement locations

The measurement location descriptions are noted in **Table 10.6** and illustrated in **Image 10.2**:. The monitoring microphone was attached to a tripod extending approximately 1.5m above ground level and positioned approximately 3.5m away from any reflective surface in accordance with the EPA Guidance, NG4 (EPA, 2016). Measurement locations at residential properties were positioned at property boundaries.

Table 10.6: Baseline noise monitoring locations

Survey Location	Description
NML1	Outside the residential properties on Factory Hill to the north of the Proposed Development
NML2	Outside the Radisson Blu Hotel
NML3	Outside the residential properties on Factory Hill to the west of the Proposed Development

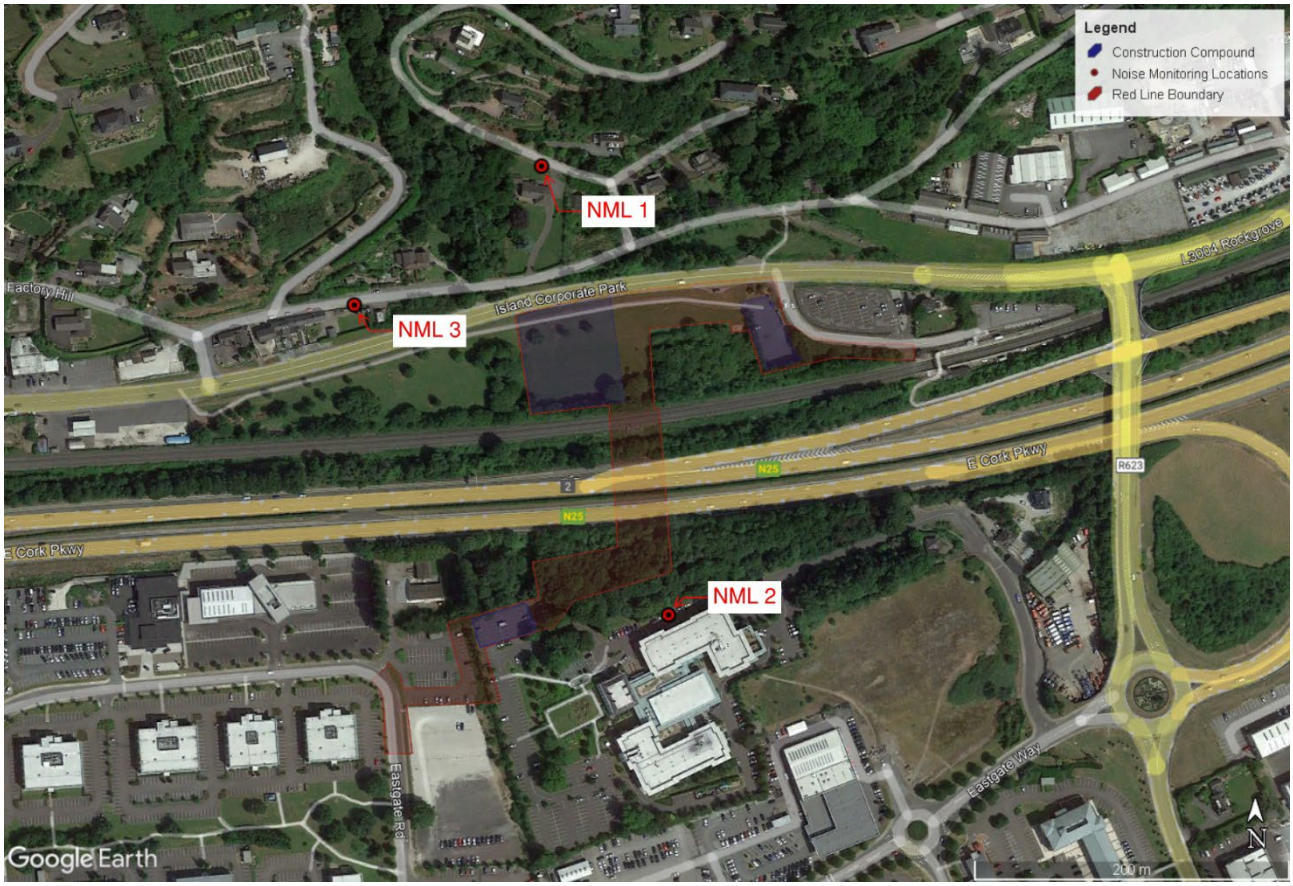

Image 10.2: Baseline noise monitoring locations

10.3.3 Instrumentation

Measurements were carried out using the equipment detailed in **Table 10.7**. The sound level meter and microphone are Type 1 conforming to BS EN 61672-1:2013 (BSI, 2013). A calibration check of the sound level meter and microphone was carried out before and after use, with no significant drift in meter response. The meter is calibrated in line with International Electrotechnical Commission (IEC) requirements and is traceable to international standards. A windshield was used to provide the microphone with effective wind protection to ensure that local meteorological conditions did not impact on the monitoring.

Table 10.7: Instrumentation details

Manufacturer	Type Number	Serial Number	Description
Brüel & Kjær	2250	2602664	Sound level meter
Brüel & Kjær	4189	2600946	1/2" polarised microphone
Brüel & Kjær	4231	3011816	Sound pressure level calibrator

10.3.4 Procedure

Measurements were conducted at each location for a period of one hour. The results were noted onto an environmental noise survey record sheet immediately following each sample and were also saved to the instrument memory for later analysis, where required. Survey personnel noted the primary noise sources contributing to noise build-up.

10.3.5 Weather

The weather during the survey period was dry with a mild temperature of 18°C for the duration of the survey. Winds were light and ranged from 2 m/s – 4 m/s. Meteorological details are outlined in **Table 10.8**.

Table 10.8: Meteorological data during the survey (Source: Met Eireann and onsite measurements)

Date	Period	Temp (℃)	Wind speed (m/s)	Rainfall (mm)	Cloud Cover Overhead (%)
25/07/2023	Day	18	NML1: 2 m/s NEE NML2: 3m/s NNE NML3: 4 m/s NNE	None	60

10.3.6 Measurement parameters

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

- L_{Aeq} is the equivalent continuous sound level. It can be considered as the 'average' and is used to describe a fluctuating noise in terms of a single noise level over the sample period. It is typically used as a descriptor for ambient noise;
- L_{A10} is the sound level that is exceeded for 10% of the sample period. It is typically used as a descriptor for traffic noise; and
- L_{A90} is the sound level that is exceeded for 90% of the sample period. It is typically used as a descriptor for background noise.

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 2 x 10^{-5} Pa.

10.3.7 Results of the noise survey

Table 10.9 presents the results of the attended measured noise levels for each of the three survey locations.

The results of the survey have indicated that baseline noise levels at all locations assessed are dominated by existing traffic flows along the N25 and L3004 Glounthaune Road.

At location NML1, the noise climate was dominated by road traffic movements on the N25. Other noise sources included traffic on the local road, bird song, wind in trees and a train horn noise. A JCB digger and tractor trailer passed directly by the sound level meter in this location and made a brief but loud noise. Ambient noise levels were measured at 62 dB L_{Aeq}. Background noise levels were measured to be 54 dB L_{A90}.

At location NML2, the noise climate was dominated by road traffic movements on the N25. Other noise sources included birdsong, wind in trees, cars entering and leaving the Radisson Blu Hotel car park, a train horn, a plane passing overhead, and low-level noise from the gym adjacent to the monitoring location. For the final 2 minutes of the measurement a lawnmower could be heard as Radisson Blu Hotel staff were attending the outdoor green areas. Ambient noise levels were measured at 65 dB L_{Aeq}. Background noise levels were measured to be 62 dB L_{A90}.

At location NML3, the noise climate was dominated by road traffic movements on the N25 and the traffic on L3004 Glounthaune Road. Other noise sources included traffic passing on the local Factory Hill Road, a train horn, somebody recycling glass, birdsong, wind in trees, and distant construction noise. The JCB digger and tractor trailer also passed while monitoring at this location. Although the noise level was high, it was short lived. Ambient noise levels were measured at 60 dB L_{Aeq}. Background noise levels were measured to be 55 dB L_{A90}.

Table 10.9: Baseline noise monitoring results

Location	Start time and duration of the survey	L_{Aeq} (dB)	L_{A10} (dB)	L_{A90} (dB)	L_{Amax} (dB)	Notes
NML1	25/07/2023 12:00 (60 mins)	62	58	54	89	Free-field

Location	Start time and duration of the survey	L_{Aeq} (dB)	L_{A10} (dB)	L_{A90} (dB)	L_{Amax} (dB)	Notes
NML2	25/07/2023 13:40 (60 mins)	65	67	62	78	Free-field
NML3	25/07/2023 15:12 (60 mins)	60	60	55	84	Free-field

10.3.8 Noise sensitive receptors

The guidance defines noise sensitive receptors as locations including residential housing, schools, hospitals, places of worship, sports centres and shopping areas, i.e., locations where members of the public are likely to be regularly present. There are a number of noise sensitive receptors in proximity to the Proposed Development. The following are the properties present within 300m of the Proposed Development which are considered 'sensitive' in terms of noise:

- Radisson Blu Hotel & Spa, approximately 50m south of the Proposed Development; and
- Multiple residential properties to the north and northwest of the Proposed Development, with the closest located approximately 80m north of the Proposed Development.

Most properties surrounding the Proposed Development site are industrial developments. There are currently no hospitals, schools or places of worship within 300m of the Proposed Development.

Sensitive receptors in the wider area include Cork Golf Club, approximately 570m south of the Proposed Development, the Little Island National School, approximately 580m southwest of the Proposed Development, the Time of Wonder Montessori School, approximately 600m southeast of the Proposed Development, St. Lappan's Church, approximately 640m southwest of the Proposed Development and the Little Island Dental Surgery, approximately 670m southeast of the Proposed Development.

10.4 Potential Impacts

10.4.1 Do nothing scenario

In the scenario where the Proposed Development does not proceed as planned, none of the impacts set out in this chapter would occur. Under the 'do nothing' scenario, the existing baseline presented in Section 10.3 is likely to persist and no significant impacts would arise in the absence of other developments.

10.4.2 Construction Phase

10.4.2.1 Noise

The Construction Phase of the Proposed Development will be carried out in eight stages of construction – refer to **Chapter 5**, *Construction* for further details. There is potential for noise generation from various activities during construction, such as site clearance, excavation, piling and concrete works, the operation of plant and construction vehicles.

From a construction noise assessment perspective, three main overarching stages have been assessed which encompass all works during the Construction Phase, namely; site clearance and preparation, construction and deliveries. Some works, such as tree felling, may be carried out as advance works. Should this occur, these activities are not expected to exceed the predicted noise levels outlined in Section 0.

The noise associated with the construction works has the potential to impact on the neighbouring residential and commercial properties for the 18-month duration of the construction works. Potential impacts will be localised in nature.

Typical noise levels for construction plant are given in BS5228-1 (BSI, 2014). The assumed construction plant items for the stages detailed above are presented in **Table 10.10**.

Table 10.10: Assumed construction plant for site clearance and preparation, construction and deliveries

Item of Plant	BS 5228-1 data reference	Sound power level (dB(A)) (from BS 5228-1)	% on-time (i.e., proportion of day operating)	No. of plant items
Site clearance and preparation				
Tracked excavator	C 1-10	113	50	1
Dump truck (empty)	C2-31	115	20	1
Dozer	C2-36	109	50	1
Dumper	C4-4	104	40	1
Dumper	C4-6	107	40	1
Mini excavator with hydraulic breaker	C5-2	111	10	1
Construction				
Vibratory piling rig	C3-8	116	20	1
Cement mixer truck	C4-18	103	10	1
Tracked mobile crane	C4-50	99	20	1
Tower crane	C4-49	105	20	1
Wheeled mobile telescopic crane	C4-38	106	20	1
Deliveries				
Articulated dump truck (tipping fill)	C2-32	102	20	1
Lorry	C2-34	108	20	1

It is considered unlikely that night time piling works will be required. Nonetheless, a separate night time piling assessment has been undertaken to assess this potential worst-case scenario. **Table 10.11** outlines the equipment that would be used in the cases of rotary bored piling and continuous flight auger piling being undertaken. Should night time piling occur, trucks will also be required along with a generator for lighting. Should night time piling occur, it will be limited to localised areas surrounding the N25 and the Irish Rail track and will take place during a limited number of pre-planned time windows.

Table 10.11: Assumed construction plant for night time piling

Item of Plant	BS 5228-1 data reference	Sound power level (dB(A)) (from BS 5228-1)	% on time	No. of plant items
Crane mounted auger	C.3:16	107.4	80	1
Large rotary bored piling rig	C.3:14	111.6	80	1
Diesel generator	C.4:86	93.5	100	1
Articulated dump truck	C.4:2	105.8	90	1

10.4.2.1.1 Predicted construction noise levels

Predicted construction noise levels are presented in **Table 10.12**. These predicted levels have assumed a worst-case scenario of all plant listed in **Table 10.10** operating simultaneously from 10 - 50% of the time.

Table 10.12: Predicted unmitigated construction noise levels at noise sensitive receptors

Noise sensitive receptor	Distance from works to Proposed Development (m)	Predicted noise level for site clearance and preparation, L_{Aeq} [dB]	Predicted noise level for site construction, L_{Aeq} [dB]	Predicted noise level for deliveries, L_{Aeq} [dB]
Radisson Blu Hotel	50	72	68	60
Residential properties to the north of the Proposed Development	80	68	64	56
Residential properties to the north and northwest of the Proposed Development	300	56	52	45

It is noted that for the Radisson Blu hotel, which is located approximately 50m from the Proposed Development, an exceedance of the threshold noise level is predicted for daytime works. On this basis, in the absence of mitigation measures, this noise sensitive receptor may be subject to a moderate to major, negative, short-term impact during the Construction Phase.

For the residential properties to the north of the Proposed Development, which are located approximately 80m from the Proposed Development, in the absence of mitigation measures, they may be subject to negative, moderate to major, short-term impact during the construction phase.

For the residential properties to the north and northwest of the Proposed Development, located 300m or greater from the Proposed Development, in the absence of mitigation measures, they may be subject to a negative, slight to moderate, short-term impact during the Construction Phase.

The above impact ratings have been determined by comparing the predicted construction noise levels in **Table 10.12** with the existing ambient noise levels (L_{Aeq}) in **Table 10.9** and applying the impact ratings from **Table 10.3** and **Table 10.4**.

Predicted noise levels for the night time piling assessment are outlined in **Table 10.13**.

Table 10.13: Predicted unmitigated night piling noise levels at sensitive receptors

Piling method	Sound pressure level at 50m (dBA)	Sound pressure level at 100m (dBA)	Sound pressure level at 200m (dBA)	Sound pressure level at 300m (dBA)
Crane mounted auger	67	61	55	52
Large rotary bored piling rig	70	64	58	54

Note: Both methods include Diesel Generator and Articulated Dump Truck.

For the Radisson Blu hotel, which is located approximately 50m from the Proposed Development, an exceedance of the threshold noise level is predicted for night-time piling works. When the worst-case piling scenario is assessed, in the absence of mitigation measures, this noise sensitive receptor may be subject to a negative, significant, temporary impact if night-time piling is required.

For the residential properties to the north of the Proposed Development, which are located approximately 80m from the Proposed Development, when the worst-case piling scenario is assessed, in the absence of mitigation measures, they may be subject to a negative, significant, temporary impact if night-time piling is required.

For the residential properties to the north and northwest of the Proposed Development, located 300m or greater from the Proposed Development, when the worst-case piling scenario is assessed, in the absence of mitigation measures, they may be subject to a negative, moderate to major, temporary impact if night-time piling is required.

10.4.2.2 Vibration

There is the potential for nearby sensitive receptors to be impacted by vibration during the Construction Phase. A variety of items of plant and vehicles will be in use which may potentially result in vibration emissions, such as excavators, piling rigs, lifting equipment and dump trucks. There will be vehicular movements to and from the site that will make use of existing roads and site access points.

In the case of the Proposed Development, the plant that is most likely to result in vibration emissions is the piling equipment. Empirical data has been selected from BS-5228-2 (BSI, 2014) to identify whether there is potential for vibration emissions to impact on local receptors.

The sensitive receptor locations remain as defined in the construction noise assessment. It should be noted that the closest sensitive receptor to the piling works is estimated to be 50m from the Proposed Development. Continuous flight auger (CFA) piles or rotary bored piles at suitable depth and spacing will be specified in order to avoid the excessive noise and vibrations in close proximity to the surrounding sensitive receptors. The advantage of selecting CFA piles is they are virtually vibration free.

Foundations for all structures, except the embankments, are proposed to be bored reinforced concrete piles. Piling methods that are least likely to give rise to unacceptable vibrations such as CFA piles are proposed to be used as outlined in **Chapter 5**, *Construction Strategy*.

BS5228-2 (BSI, 2014) empirical vibration data is presented in **Table 10.14**. BS5228-2 notes that complaints are likely to occur where vibration levels are above 1.0 mm/s PPV at residential receptors.

Table 10.14: BS5228-2 empirical vibration data

Piling Type	Distance (m)	Range of PPV (mm/s)
Rotary bored (BS 5228-2 D.6)	10	0.3 – 3.2
Continuous Flight Auger (BS 5228 D.6)	20	0.1 - 0.3

As can be seen in **Table 10.14**, piling is not expected to emit vibrations that may cause damage or annoyance. Given the low level of predicted vibration, the potential impact at nearby sensitive receptors, in the absence of mitigation measures, will be not significant and short-term.

10.4.3 Operational Phase

The Operational Phase of the Proposed Development has the potential to generate a positive impact on noise and vibration due to a modal shift from private car to more sustainable modes, resulting in a possible decrease in traffic noise and vibration. No negative Operational Phase impacts are likely to occur.

10.4.4 Decommissioning Phase

As outlined in **Chapter 4**, *Description of the Proposed Development*, the design life of the Proposed Development is 120 years. During the potential future decommissioning works, it is proposed that the bridge will be removed in a reverse fashion to the proposed construction sequence.

The main bridge span and approach spans will be decommissioned by cutting the concrete decking and steel spans into a number of large sections. This will be done either in situ or at ground level, with the decking and spans being lifted out by a mobile crane and moveable gantry.

Noise and vibration impacts will be generated by the decommissioning activities. The decommissioning activities will be similar to the proposed construction activities, albeit they will occur over a shorter duration. The primary noise and vibration causing activity will be the cutting and removal of large sections of the concrete decking and steel spans. The impacts will be no greater than those presented for the Construction Phase in Section 10.4.2

10.5 Mitigation and Monitoring

This section describes the measures that will be taken to minimise the potential for noise and vibration disturbance to the surrounding area during the construction and Operational Phases of the Proposed Development.

10.5.1 Construction Phase

The below good industry practice will be employed to minimise, control and manage potential noise and vibration impacts at nearby sensitive receptors during the Construction Phase.

Standard practice construction techniques and methods will be implemented to ensure construction noise and vibration levels remain within acceptable limits. The works shall be carried out in accordance with the requirements of BS 5228-1:2009+A1:2014, Code of practice for noise and vibration control on construction and open sites (BSI, 2014).

These are documented within the CEMP in **Appendix 5.1** in **Volume 4** of this EIAR. The following provisions, although not exhaustive, will be adhered to where practicable throughout the Construction Phase:

- Vehicles and mechanical plant used for the purpose of the works will be fitted with effective exhaust silencers, maintained in good and efficient working order and operated in such a manner as to minimise noise emissions. The contractor will ensure that all plant complies with the relevant statutory requirements;
- Machines in intermittent use will be idling or throttled down to a minimum when not in use;
- Compressors will be fitted with properly lined and sealed acoustic covers which will be kept closed whenever in use. Pneumatic percussive tools will be fitted with mufflers or silencers;
- Equipment which breaks concrete, brickwork, or masonry by bending, bursting, or “nibbling” will be used in preference to percussive tools. Where possible, the use of impact tools will be avoided where the site is close to occupied premises;
- Rotary drills and bursters activated by hydraulic, chemical, or electrical power will be used for excavating hard or extrusive material;
- Wherever possible, equipment powered by mains electricity will be used in preference to equipment powered by internal combustion engine or locally generated electricity;
- No part of the works nor any maintenance of plant will be carried out in such a manner as to cause unnecessary noise except in the case of an emergency when the work is absolutely necessary for the saving of life or property or the safety of the works;
- Plant will be maintained in good working order so that extraneous noise from mechanical vibration, creaking and squeaking is kept to a minimum;
- Noise emitting machinery which is required to run continuously will be housed in a suitable acoustically lined enclosure; and
- During the Construction Phase, the appointed contractor will carry out noise and vibration monitoring at representative noise and vibration sensitive receptors to evaluate and inform the requirement and / or implementation of noise and vibration management issues. Noise monitoring will be conducted in accordance with ISO 1996-1 (ISO, 2016) and ISO 1996-2 (ISO, 2017). The selection of monitoring locations will be based on the nearest representative noise and vibration sensitive receptors to the working area.

It is recommended that an acoustic barrier be installed as mitigation for all working areas, which will reduce noise levels overall by 10 dB.

10.5.2 Operational Phase

As no negative Operational Phase impacts are expected to arise, no mitigation or monitoring measures are required.

10.5.3 Decommissioning Phase

The mitigation and monitoring measures as described above for the Construction Phase will be updated to reflect best practice at the time, and will be implemented for the Decommissioning Phase, as required.

10.6 Cumulative Impacts

A review of Cork County Council (CCC), An Bord Pleanála (ABP) and Department of Housing, Local Government and Heritage (DHLGH) online planning records has indicated that other projects have been proposed within the surrounding area that may give rise to cumulative impacts (refer to **Chapter 20**, *Cumulative and Interactive Impacts*).

The identified projects are:

- Three storey extension to the existing Radisson Blu Hotel & Spa, Little Island; and
- Construction of light industrial building, Euro Business Park, Little Island.

The construction of the light industrial building in Euro Business Park, Little Island is greater than 300m from the Proposed Development and can therefore be scoped out of this cumulative assessment.

The 30 no. bedroom extension to the Radisson Blu Hotel & Spa, Little Island has been granted conditional planning permission. Due to the proximity of this project to the Proposed Development, there is potential for cumulative noise and vibration impacts should its Construction Phase overlap with the Construction Phase of the Proposed Development.

In the event of any concurrent noisy construction activity being carried out on the site of the Proposed Development and the adjacent Radisson Blue Hotel & Spa site, the Project Supervisor Construction Stage (PSCS) will ensure that controls and mitigation measures are implemented as set out in Section 10.5.1 to ensure that no significant cumulative impacts will arise at nearby sensitive receptors.

No potential for cumulative impacts were identified during the Operational Phase.

10.7 Residual Impacts

10.7.1 Construction Phase

A summary of the residual impacts of construction noise for the worst-case construction stage considered (i.e., site clearance and preparation) is presented in **Table 10.15**.

It is assumed that an acoustic barrier will be installed as mitigation for all working areas which will reduce noise levels by approximately 10dB.

Table 10.15: Summary of residual impacts from construction noise

Noise sensitive receptor	Existing noise level (dB)	Predicted noise level (pre-mitigation), L_{Aeq} [dB]	Potential impact (pre-mitigation)	Predicted noise level (post mitigation), L_{Aeq} [dB]	Predicted impact (post mitigation)
Radisson Blu Hotel (at 50m)	65	72	Moderate to major, negative impact. Short-term.	62	Neutral to slight impact. Short-term.
Residential properties to the north of the Proposed Development (at 80m)	62	68	Moderate to major, negative impact. Short-term.	58	Neutral to slight impact. Short-term.
Residential properties to the north and northwest of the Proposed Development (at 300m)	55	56	Neutral to slight, negative impact. Short-term.	46	Neutral to slight impact. Short-term.

A neutral to slight, short-term residual impact is predicted at the Radisson Blu Hotel, the residential properties to the north of the Proposed Development and the residential properties to the northwest of the Proposed Development, once mitigation measures have been implemented.

Predicted noise levels in this report are worst case, with all construction plant operating simultaneously during the worst-case stage – i.e., site clearance and preparation. It is unlikely that the predicted noise level will occur over the full construction period.

Table 10.16 outlines the residual impacts for the worst-case scenario if night time piling is required and if rotary bored piling is used as the chosen piling method. As no baseline night time noise survey was undertaken, the existing night time noise levels presented in **Table 10.16** were obtained from the EPA L_{night} road noise maps (EPA, 2023).

Table 10.16: Summary of residual impacts from night time piling works

Assessment topic / receptor	Existing noise level (dB)	Predicted noise level (pre-mitigation), L_{Aeq} [dB]	Potential impact (pre-mitigation)	Predicted noise level (post mitigation), L_{Aeq} [dB]	Predicted impact (post mitigation)
50m	55	70	Significant negative impact. Temporary.	60	Slight to moderate impact. Temporary.
100m	50	64	Significant negative impact. Temporary.	54	Slight to moderate impact. Temporary.
200m	50	58	Moderate to major negative impact. Temporary.	48	Neutral to slight impact. Temporary.
300m	45	54	Moderate to major negative impact. Temporary.	44	Neutral to slight impact. Temporary.

A negative, slight to moderate, short-term residual impact is predicted at noise sensitive receptors located less than 100m from the Proposed Development, while a neutral to slight negative, short-term residual impact is predicted at noise sensitive receptors located 200m or greater from the Proposed Development, once mitigation measures have been implemented.

10.7.2 Operational Phase

The Operational Phase of the Proposed Development has the potential to generate a positive residual impact on noise and vibration due to a modal shift from private car to more sustainable modes, resulting in a possible decrease in traffic noise and vibration. No negative residual Operational Phase impacts are likely to occur.

10.7.3 Decommissioning Phase

No significant negative residual noise and vibration impacts are expected as a result of the decommissioning of the Proposed Development.

10.8 References

British Standard Institute (BSI) (1990). British Standard (BS) 7385: 1990: Evaluation and measurement for vibration in buildings. Part 1: Guide for measurement of vibrations and evaluation of their effects on buildings.

BSI (2008). BS 6472-1: 2008 Guide to evaluation of human exposure to vibration in buildings. Part 1 Vibration sources other than blasting.

BSI (2013). BS EN 61672-1:2013. Electroacoustics. Sound level meters Specifications.

BSI (2014). BS 5228-1 & 2: 2014. Code of practice for noise and vibration control on construction and open sites.

Environmental Protection Agency (EPA) (2022). Guidelines on the information to be contained in Environmental Impact Assessment Reports.

EPA (2023). EPA Maps Road Noise. Available from: https://gis.epa.ie/EPAMaps/ [Accessed: July 2023].

ISO (2016). ISO 1996-1: 2016 Acoustics - Description, measurement and assessment of environmental noise. Part 1: Basic quantities and assessment procedures.

ISO (2017). ISO 1996-2: 2017 - Description, measurement and assessment of environmental noise - Part 2: Determination of sound pressure levels.

Transport Infrastructure Ireland (TII) (previously National Roads Authority (NRA)) (2004). Guidelines for the Treatment of Noise and Vibration in National Road Schemes.

Transport Infrastructure Ireland (TII) (previously National Roads Authority (NRA)) (2014). Guidelines for the Treatment of Noise and Vibration in National Road Schemes, Revision 1.

Directives and Legislation

S.I. No. 140/2006 – European Communities (Environmental Noise) Regulations 2006.