

10 NOISE AND VIBRATION

10.1 Introduction

This chapter of the EIAR provides a description and assessment of the likely effect of the Proposed Development from noise and vibration.

This chapter discusses the existing ambient noise levels at nearby sensitive receptors, the potential effects of the Proposed Development on the existing ambient noise environment and the mitigation measures that will be employed to reduce or eliminate any potential effects.

This assessment will examine the likely effects of sound pressure levels generated by the Proposed Development located north of the Boherboy Road, approximately 2km south-west of Tallaght Town Centre, 1.1Km east of Saggart, 700m south-west of Citywest Shopping Centre and 1.6Km south of the N7. Noise calculations have been used to predict and assess the likely effect of operations on noise sensitive receptors.

10.1.1 Quality Assurance and Competency of Experts

This chapter of the EIAR has been prepared by Wave Dynamics Limited (hereinafter referred to as 'WDA') an Acoustic Consultancy specialising in noise and vibration. The EIAR chapter was prepared by Cathal Reck, Acoustic Consultant. Cathal has experience of numerous similar planning stage EIAR noise and vibration assessments. Cathal holds a BSc (Hons) in Music Technology and Production, Institute of Acoustics (IOA) Certificate of Competence in Environmental Noise Measurement and a Certificate in Building Acoustics and Noise Control. Cathal is a member of the Institute of Acoustics (TechIOA) and a (SITRI) Sound Insulation Testing Register certified sound insulation tester.

This chapter was peer reviewed by James Cousins, Managing Director and Principal Consultant with WDA who has 14 year's industry experience in assessing noise and vibration from road and rail infrastructure on commercial and residential developments. James is an experienced consultant. His qualifications include a BSc (Hons) in Construction Management and Engineering, Pg Cert in Construction Law and Diploma in Acoustics and Noise Control (Institute of Acoustics) and an IOA Competence Cert in Building Acoustic Measurements. James is a member of both Engineers Ireland (MIEI) and the Institute of Acoustics (MIOA) and is the current SITRI Chairman.

10.2 Study Methodology

The assessment of noise and vibration effects associated with the Proposed Development has been undertaken with reference to the most appropriate guidance documents relating to environmental noise and vibration which are set out within the relevant sections of this chapter. In addition to specific noise guidance documents, the following guidelines were considered and consulted for the purposes of this chapter:

- Design Manual for Roads and Bridges Volume 11 Section 3 Part 7 (HD 213/11 – Revision 1) (The Highways Agency et al., 2011);
- BS 8233:2014 Guidance on sound insulation and noise reduction for buildings;

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- BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise;
- BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Vibration;
- BS 7385: 1993: Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration;
- ISO 1996-1:2016 Acoustics - Description, measurement and assessment of environmental noise. Part 1: Basic quantities and assessment procedures;
- ISO 1996-2:2017 Acoustics - Description, measurement and assessment of environmental noise Part 2: Determination of sound pressure levels;
- ISO 9613-1:1993 Acoustics - Attenuation of sound during propagation outdoors -- Part 1: Calculation of the absorption of sound by the atmosphere;
- ISO 9613-2:1996 Acoustics - Attenuation of sound during propagation outdoors -- Part 2: General method of calculation;
- British Standard BS 6472-1:2008 Guide to evaluation of human exposure to vibration in buildings;
- Environmental Protection Agency (2016) Guidance Note for Noise (NG4): Licence Applications, Surveys and Assessments in Relation to Scheduled Activities;
- BS 4142:2014+A1:2019: Methods for rating and assessing industrial and commercial sound;
- Guidelines for the Treatment of Noise & Vibration in National Road Schemes, National Roads Authority, Revision 1, 25th October 2004;
- ProPG 2017 Professional Practice Guidance on Planning & Noise;
- AAAC: Licensed Premises Noise Assessment Technical Guideline;
- NRA Traffic Grid Flow Pattern;
- ISO 9613-2: 1996 (Parkplatzlarmstudio 2007);
- Calculation of Road Traffic Noise (CoRTN): 1998;
- S.I. No. 549/2018 – European Communities (Environmental Noise) Regulations 2018 (hereafter referred to as the Noise Regulations);
- S.I. No. 241/2006 - European Communities Noise Emission by Equipment for Use Outdoors (Amendment) Regulations 2006;
- WHO Environmental Noise Guidelines (2019).
- South Dublin County Council County Development Plan, 2022-2028.
- Dublin Agglomeration Noise Action Plan 2024-2028

The noise and vibration study has been undertaken using the following methodology:

- A baseline environmental noise survey has been undertaken on, and in the vicinity of, the Proposed Development site in order to characterise the existing baseline noise environment and to assess the character of the existing noise;
- A review of the most applicable standards and guidelines has been conducted in order to set a range of acceptable noise and vibration criteria for the construction and operational phases of the Proposed Development;
- Predictive statistical calculations have been performed for during the construction phase of the project at the nearest sensitive locations to the Proposed Development site;

- Predictive modelling using SoundPlan 9.1 and statistical calculations have been performed to assess the potential effects associated with the operational phase of the Proposed Development at the most sensitive locations surrounding the Proposed Development site; and
- Mitigation measures have been proposed to reduce, where necessary, the identified potential outward effects relating to noise and vibration from the Proposed Development.

10.3 The Existing and Receiving Environment (Baseline Situation)

A baseline noise survey was conducted to assess the baseline noise situation at the Proposed Development site located to the north of the Boherboy Road, Corbally, Dublin 24. The purpose of the survey was to quantify the existing noise environment to predict its effect on the future occupants of the Proposed Development.

An attended and unattended noise survey was conducted to quantify the existing noise environment. The attended measurement survey also included measurements across the site for calibration of the distance attenuation calculations and noise model. The unattended noise measurements were undertaken on the 29th of January 2025 at 13:30hrs and collected on the 5th of February 2025 at 10:30hrs, attended measurements were taken on the 29th of January 2025 and the 5th and 6th of February 2025, to capture the noise climate during both the daytime and nighttime periods under normal operating conditions.

10.3.1 Site Description and Measurement Locations

The site is located to the north of Boherboy Road, approximately 2Km south-west of Tallaght Town Centre, 1.km east of Saggart, 700m south-west of Citywest Shopping Centre and 1.6km south of the N7. The site is bounded by residential dwellings to the north and east. The areas to the west and south are predominantly undeveloped, agricultural lands. Three streams cross the site. These include the Corbally Stream, the Cooldown Stream and the Coldwater Stream. There are also a number of hedgerows running both around the edges of the site as well as through the site itself. Figure 10-1 outlines the site location, measurement location and noise sensitive locations in the surrounding area.

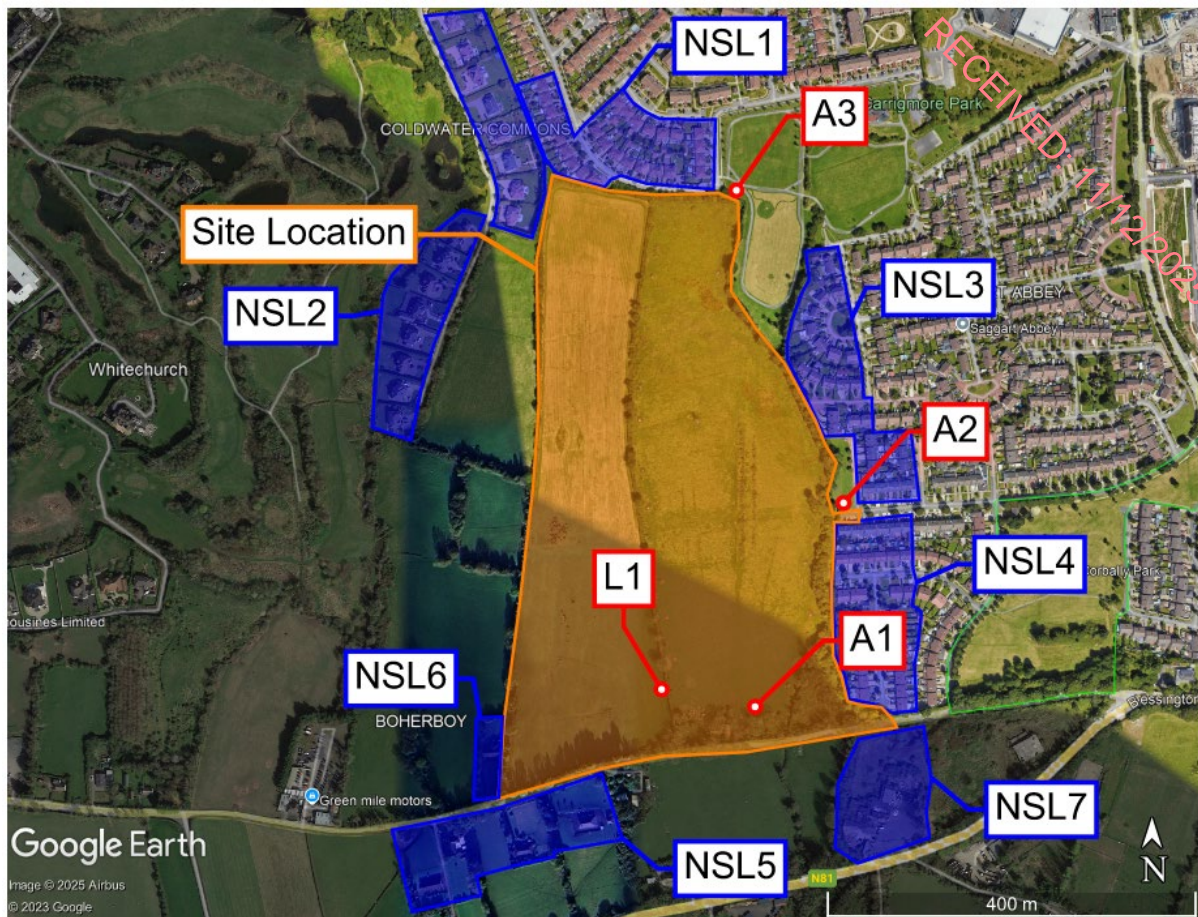


Figure 10-1: Site Location, Measurement Locations L1, A1-A3, and Noise Sensitive Locations (NSLs) 1-7.

10.3.2 Survey Methodology and Personnel

The attended and unattended surveys were completed by Daniel Cousins (Operations Manager).

The unattended noise measurements were taken from the 29th of January 2025 at 13:30hrs and collected on the 5th of February 2025 at 10:30hrs

The attended noise measurements took place on the 29th of January 2025 and the 5th and 6th of February 2025.

10.3.2.1 Measurement Locations

This section outlines the chosen measurement locations and justification for the chosen measurement locations.

L1:

Unattended noise measurements were performed at location L1. This site was selected because it offered a secure point to mount the noise logger, mitigating the risk of theft or damage. Additionally, it accurately represents the facades most exposed to noise from the surrounding road traffic.

A1:

Attended noise measurements were undertaken at location A1 to establish baseline noise levels. The data was used to determine background noise levels in the vicinity of sensitive receptors NSL4 and NSL7. Furthermore, the noise model was calibrated with these measurements to enhance the accuracy of predicted noise levels from existing road traffic on the proposed development.

A2:

Attended measurements were undertaken at location A2 to establish the baseline noise levels. The data was used to determine background noise levels in the vicinity of sensitive receptors NSL3 and NSL4. Furthermore, the noise model was calibrated with these measurements to enhance the accuracy of predicted noise levels from existing road traffic on the proposed development.

A3:

Attended measurements were undertaken at location A3 to establish the baseline noise levels. The data was used to determine background noise levels in the vicinity of sensitive receptors NSL1, NSL2 and NSL3. Furthermore, the noise model was calibrated with these measurements to enhance the accuracy of predicted noise levels from existing road traffic on the proposed development.

10.3.2.2 Unattended Noise Measurements

An unattended noise logger was deployed in location L1 in general accordance with ISO 1996-1:2016 using ISO Class 1 sound analysers. The monitor was deployed on the 29th of January 2025 at 13:30hrs and collected on the 5th of February 2025 at 10:30hrs. The logger was anchored to the ground and placed on a tripod positioned approximately 1.5m above the ground as outlined in Figure 10-2. The logger was calibrated before and after the measurements and no significant drift was noted. Measurements were filtered for periods of unsuitable weather conditions (where appropriate).



Figure 10-2 Unattended Noise Measurement Setup

10.3.2.3 Attended Noise Measurements

Noise measurements were undertaken in general accordance with ISO 1996-1:2016 using ISO Class 1 sound analysers. Attended measurements were taken for a duration of 15-60 minutes in the locations A1-A3 and L1 as illustrated in Figure 10-1.

Care was taken to avoid any effect on the measurement of extraneous noise, acoustic vibration, or interference. During the attended noise measurements, the sound level meter was positioned at approximately 1.5m above the ground level as outlined in Figure 10-3. The weather conditions were calm (wind less than 5m/s) with no rain, a wind shield was used for the duration of the attended surveys. The noise logger was calibrated before and after the survey and no significant drift was noted.



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Figure 10-3: Attended noise measurement setup.

10.3.3 Survey Period

The attended noise measurement survey was undertaken on the 29th of January 2025 and the 5th and 6th of February 2025. The unattended survey took place from 29th of January 2025 at 13:30hrs and collected on the 5th of February 2025 at 10:30hrs

10.3.4 Subjective Noise Environment

During the attended survey the following noise sources were noted:

- Passing road traffic,
- Overhead aircraft,
- Birdsong,

10.3.5 Noise Measurement Equipment

A Class 1 sound level meter/noise logger in general accordance with IEC 61672-1:2013 was used for the attended and unattended measurements. Table 10-1 summarises the measurement equipment used.

Table 10-1 Noise Measurement Equipment Used for the Attended and Unattended Surveys.

Description	WD Asset Number	Model	Serial No.	Calibration Certificate No.	Calibration Due Date
Sound Level Meter	SLM2	Nor 140	1406532	UCRT25/2495	20/10/2027
Sound Level Meter	SLM7	Nor 140	1405924	48183	25/06/2026
Calibrator	CAL4	Larson Davis CAL200	21085	AC250309	22/07/2026

10.3.6 Noise Measurement Results

Attended measurements were taken to measure the existing noise climate in the area. This section outlines the results of both the attended and unattended noise measurements.

10.3.6.1 Attended Measurement Results

Table 10-2 illustrates the results of the attended noise measurement survey conducted on the 29th of January 2025 and the 5th and 6th of February 2025.

Table 10-2 Attended Measurement Results

Measurement				Measurement Noise Levels		
Location	Date	Time (hrs)	Duration (mins)	L _{Aeq} dB	L _{AFmax} dB	L _{A90} dB
L1	29/01/2025	12:53	15:00	54	64	48
A1	29/01/2025	13:28	15:00	53	62	48
A2	29/01/2025	13:52	15:00	49	60	47
A3	29/01/2025	14:21	15:00	51	68	48
A1	06/02/2025	10:13	15:00	54	65	48
L1	06/02/2025	10:58	15:00	54	69	46
A2	06/02/2025	11:44	15:00	47	61	44
A3	06/02/2025	12:25	15:00	47	58	43

10.3.6.2 Sound Exposure Levels (SEL)

This section outlines the instances where aircraft were recorded passing over the Proposed Development site, measurement results are outlined in Table 10-3.

Table 10-3 Sound Exposure Measurement Results

Aircraft Model	Date	Location	Time (hrs)	Duration (Seconds)	L _{Aeq} dB	L _{AFmax} dB	SEL dB
--	29/01/2025	L1	12:37	12	61	68	72

Aircraft Model	Date	Location	Time (hrs)	Duration (Seconds)	L _{Aeq} dB	L _{AFmax} dB	SEL dB
--	06/02/2025	A1	10:30	11	54	60	64
IDF Helicopter	06/02/2025	L1	10:54	26	61	70	75
IDF Helicopter	06/02/2025	L1	10:58	21	57	64	70
--	06/02/2025	A3	12:24	35	53	61	68

10.3.6.3 Unattended Noise Measurement Results

Table 10-4 outlines the results of noise measurements at the unattended monitoring location L1. A full breakdown of all of the unattended measurement results are provided in Volume III, Appendix 10-1.

Table 10-4 Unattended Measurement Results

Start Date	L _{Aeq,16hour} (07:00 – 23:00) dB	L _{night} (L _{Aeq,8hour} 23:00 – 07:00) ⁽¹⁾ dB	L _{den} (00:00 – 00:00) dB	10 th highest night-time L _{AFmax} dB	L _{A90} (23:00 – 07:00) ⁽²⁾ dB
30/01/2025	54 ⁽¹⁾	50	56 ⁽¹⁾	62	43
31/01/2025	56	51	58	62	45
01/02/2025	55	45	58	62	35
02/02/2025	54	46	56	62	36
03/02/2025	53	47	55	63	40
03/02/2025	56	53	57	69	46
04/02/2025	57	50	60	63	43
05/02/2025	57 ⁽¹⁾	N/A	60 ⁽¹⁾	N/A	N/A

- 1) Shortened measurement duration i.e the unattended measurements were started at 10:15hrs and not 07:00hrs, resulting in a full period (day/night) not being recorded.
- 2) Where night-time period is referred to, the date is the date the measurement commenced on at 23:00hrs and finished at 07:00hrs on the following calendar day.

10.3.6.4 Discussion of Measurement Results

The unattended noise measurements were taken over weekend and weekday periods to establish the existing noise conditions within the boundary of the Proposed Development site at different periods. The attended measurements were taken in the surrounding area to establish the surrounding noise climate. The ambient noise consisted of traffic noise from the docks and local roads in the surrounding area as well as overhead aircraft movements at various stages of the monitoring period.

10.3.7 Weather Conditions for Monitoring Period

Good weather conditions were noted in general during the deployment and collection during the attended survey, with winds of less than 5 m/s and no rain for the attended surveys. Weather conditions during the unattended noise survey were taken from Met Eireann historic weather data archives, the historic weather data during the unattended noise survey were observed to be of calm wind conditions less than 5 m/s and little to no rainfall for the duration of the survey period.

10.4 Characteristics of the Proposed Development

A comprehensive description of the Proposed Development is presented in Chapter 2 of this EIAR.

10.5 Potential Impact of the Proposed Development

This section outlines the potential impact of the Proposed Development on the surrounding environment for the short-term construction phase and long-term operational phase of the development.

10.5.1 Description of Likely Significant Effects

The construction of the proposed development will be a multi-phase process with the potential to generate noise and vibration that could affect nearby receptors. The likely significant effects will arise from the use of heavy machinery and construction activities during these periods.

Table 10-5 Summary of Construction Phase Effects Pre Mitigation

Quality	Significance	Duration	Type
Neutral	Slight – Moderate, Moderate to Significant ¹	Temporary	Noise
Neutral	Slight	Temporary	Vibration

- 1) The significance is predicted to be slight – moderate at the majority of noise sensitive locations. Some locations are predicted to be moderate – significant for some stages of the construction (pre-mitigation).

10.5.2 Construction Phase

10.5.2.1 Construction Phase Noise

Dublin Agglomeration plan has not outlined specific construction noise limits within the Dublin Agglomeration Noise Action Plan 2024 – 2028, therefore, noise limits outlined in BS5228-1:2009+A1 have been adopted as the criteria for the Proposed Development as BS5228-1:2009+A1 is the defacto standard for assessing construction noise. BS5228-1 takes into consideration the effect of the ambient noise at the noise sensitive receptor as follows in Table 10-6:

Table 10-6 BS5228 Threshold Levels

Assessment category and threshold value period	Threshold value, in decibels (dB) (L _{Aeq})		
	Category A ¹	Category B ²	Category C ³
Daytime (07:00 – 19:00) and Saturdays (07:00 – 14:00)	65	70	75
Evenings and weekends ⁴	55	60	65
Night-time (23:00 – 07:00)	45	50	55

- 1) Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are less than these values.
- 2) Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are the same as category A values.
- 3) Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are higher than category B values.
- 4) 19:00 – 23:00 weekdays, 13:00 – 23:00 Saturdays and 07:00 – 23:00 Sunday

BS5228 defines a noise sensitive location as:

“any occupied premises outside a site used as a dwelling (including gardens), place of worship, education establishment, hospital or similar institution, or any other property likely to be adversely affected by an increase in noise level”.

10.5.2.1.1 Construction Phase Noise Limits

This section outlines the predicted construction noise and vibration effect of the Proposed Development on the surrounding sensitive locations.

The criteria for the Proposed Development are based on the criteria outlined in Table 10-6 and the background noise in the area. The construction noise criteria are outlined in Table 10-7, with distance to the NSLs based on the closest receiver at each NSL. NSL reflects a number of houses/sensitive receivers at each NSL.

Reference is made to the baseline survey results and guidance contained in BS 5228-1, which sets threshold levels for significant effects from construction activities. These thresholds are applied to the closest NSLs.

Table 10-7 Construction Noise Limits

Noise Location	Sensitive	Distance to the Centre of the Site (m) ²	Ambient Noise dB(A) L _{eq}	Noise Limit dB(A) L _{eq} ¹
NSL1		300	51	65
NSL2		300	51	65
NSL3		160	49	65
NSL4		190	54	65
NSL5		340	54	65
NSL6		370	54	65
NSL7		415	54	65

- 1) 65 dB (A) lower threshold limit.
- 2) Distance taken from the centre of the closest construction area to each NSL, based on current site layout drawings.
- 3) Blocks A and B assessed as NSL's for construction phase 2.

For the relevant assessment period (i.e. daytime in this instance due to the nature of construction working hours) the ambient noise level is determined and rounded to the nearest 5dB. If the noise generated by construction activities exceeds the appropriate category value, then a significant effect is deemed to occur.

10.5.2.1.2 Noise Predictions

Construction noise for the site has been predicted based on the information provided. A summary of the expected equipment, noise levels and operating times are provided in Table 10-8. The development will be constructed using a phased approach as outlined in Figure 10-4, the construction noise impact assessment has been broken down to specific phases to account for the dynamic movement and relocation of works throughout the phased construction.

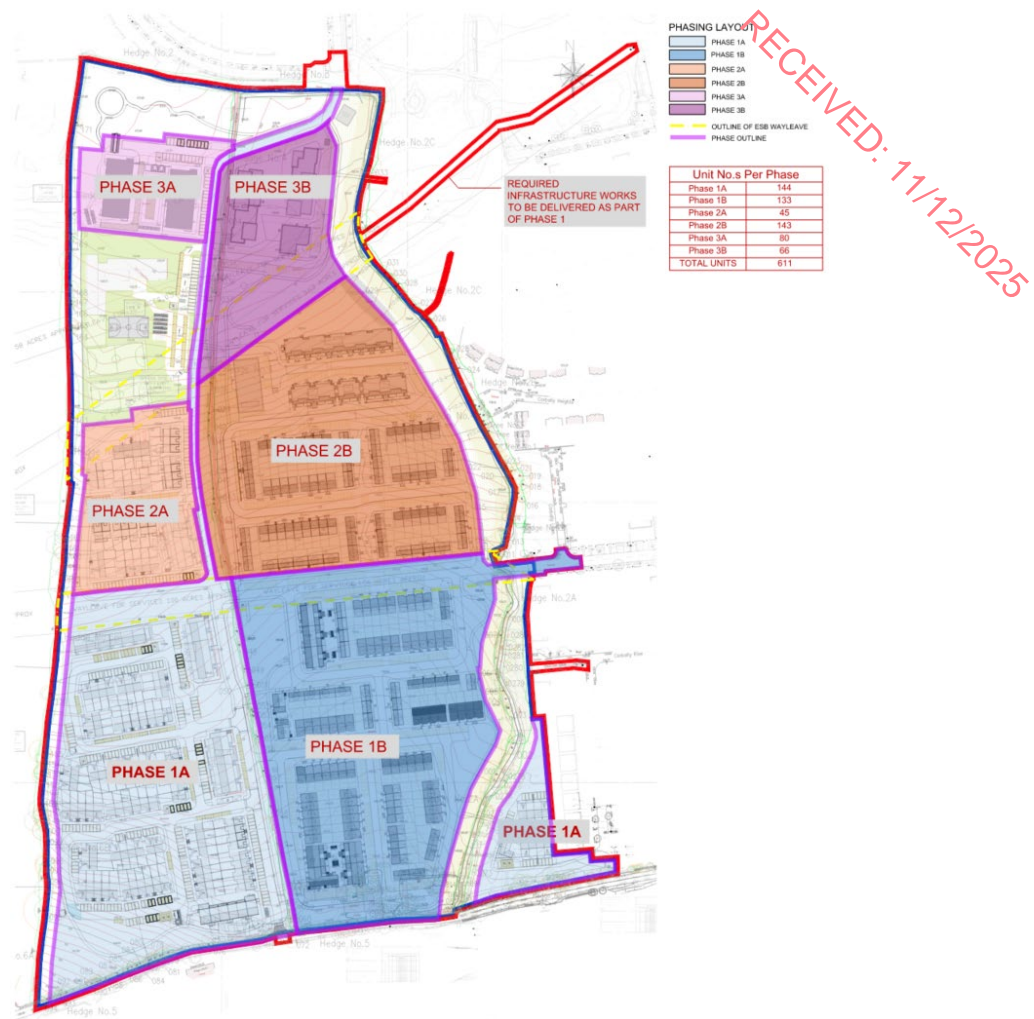


Figure 10-4: Phased Construction Approach.

As the works are transient the location of the works has been taken as an average location as is outlined in BS5228-1:2009+A1. The prediction methodology in BS 5228 has been used to calculate the noise level over a typical day for each of the main construction stages.

The closest noise sensitive receptors are outlined in Figure 10-1.

Table 10-8 Proposed Demolition and Construction Equipment, Noise Levels, and Durations

Construction Phase	Item of Plant (BS 5228-1:2009+A1:2014 Ref)	Noise Level (L _{Aeq} at 10m dB(A))	On Time of a 10 hr day
Site Setup	Digger	77	6 Hours
	Carpentry tools	78	5 Hours
	Skill saw	84	3 Hours
Substructure	Excavators	77	5 Hours
	Con Saws	84	4 Hours
	Rail Saw	85	4 Hours

Construction Phase	Item of Plant (BS 5228-1:2009+A1:2014 Ref)	Noise Level (L _{Aeq} at 10m dB(A))	On Time of a 10 hr day
	Drills (Into Concrete)	89	3 Hours
	Dumper	81	5 Hours
	Cement Mixer (Discharging)	75	4 Hours
	Lorry Idling	80	2 Hours
	Telescopic Handler	71	6 Hours
	Cement Pump	78	4 Hours
Superstructure	Drills (Into Concrete)	89	6 Hours
	Power Tools	70	5 Hours
	Impact Steel	69	2 Hours
	Hammer	69	3 Hour
	Dumper	81	3 Hours
	Cement Mixer (Discharging)	75	4 Hours
	Lorry Idling	80	2 Hours
	Telescopic Handler	71	6 Hours
External Finishes	Hand Tools	70	6 Hours
	Power Tools	70	5 Hours
Internal Finishes	N/A	N/A	N/A

Table 10-9 summarises the predicted construction noise level at the NSLs. Examination of the results indicate the construction noise without mitigation is predicted to exceed the noise limits outlined in BS 5228-1:2009+A1 during all construction stages of the Proposed Development.

Table 10-9 Predicted Noise Levels Without Mitigation for Each Stage of Phase 1A.

Location	Noise Limit dB (A)	Predicted noise level (construction noise + ambient) with no mitigation			
		L _{Aeq} , dB			
		Site Set Up	Substructure	Superstructure	External Finishes
NSL1	65	52	55	53	51
NSL2	65	53	58	55	51
NSL3	65	47	56	53	49
NSL4	65	56	59	57	54
NSL5	65	58	64	62	55
NSL6	65	61	67	64	55

Location	Noise Limit dB (A)	Predicted noise level (construction noise + ambient) with no mitigation L _{Aeq} , dB			
		Site Set Up	Substructure	Superstructure	External Finishes
NSL7	65	55	58	57	54

Table 10-10 Predicted Noise Levels Without Mitigation for Each Stage of Phase 1B.

Location	Noise Limit dB (A)	Predicted noise level (construction noise + ambient) with no mitigation L _{Aeq} , dB			
		Site Set Up	Substructure	Superstructure	External Finishes
NSL1	65	53	56	54	51
NSL2	65	53	57	54	51
NSL3	65	54	62	59	50
NSL4	65	61	67	64	55
NSL5	65	55	59	57	54
NSL6	65	55	59	57	54
NSL7	65	56	59	57	54
Phase 1A	65	58	63	61	54

Table 10-11 Predicted Noise Levels Without Mitigation for Each Stage of Phase 2A.

Location	Noise Limit dB (A)	Predicted noise level (construction noise + ambient) with no mitigation L _{Aeq} , dB			
		Site Set Up	Substructure	Superstructure	External Finishes
NSL1	65	53	58	56	51
NSL2	65	55	61	58	51
NSL3	65	51	59	56	49
NSL4	65	56	59	57	54
NSL5	65	55	58	56	54

Location	Noise Limit dB (A)	Predicted noise level (construction noise + ambient) with no mitigation L _{Aeq} , dB			
		Site Set Up	Substructure	Superstructure	External Finishes
NSL6	65	56	59	57	54
NSL7	65	55	57	56	54
Phase 1A	65	58	64	61	54
Phase 1B	65	57	62	59	54

Table 10-12 Predicted Noise Levels Without Mitigation for Each Stage of Phase 2B.

Location	Noise Limit dB (A)	Predicted noise level (construction noise + ambient) with no mitigation L _{Aeq} , dB			
		Site Set Up	Substructure	Superstructure	External Finishes
NSL1	65	54	59	56	51
NSL2	65	53	57	55	51
NSL3	65	58	66	63	51
NSL4	65	58	63	61	54
NSL5	65	55	57	56	54
NSL6	65	55	57	56	54
NSL7	65	55	57	56	54
Phase 1A	65	55	59	57	54
Phase 1B	65	57	62	59	54
Phase 2A	65	58	64	61	55

Table 10-13 Predicted Noise Levels Without Mitigation for Each Stage of Phase 3A.

Location	Noise Limit dB (A)	Predicted noise level (construction noise + ambient) with no mitigation L _{Aeq} , dB			
		Site Set Up	Substructure	Superstructure	External Finishes
NSL1	65	62	69	66	54
NSL2	65	58	65	62	52
NSL3	65	52	60	57	50
NSL4	65	55	57	56	54
NSL5	65	54	56	55	54
NSL6	65	54	56	55	54
NSL7	65	54	56	55	54
Phase 1A	65	55	58	56	54
Phase 1B	65	54	57	56	54
Phase 2A	65	55	61	58	50
Phase 2B	65	54	60	58	50

Table 10-14 Predicted Noise Levels Without Mitigation for Each Stage of Phase 3B.

Location	Noise Limit dB (A)	Predicted noise level (construction noise + ambient) with no mitigation L _{Aeq} , dB			
		Site Set Up	Substructure	Superstructure	External Finishes
NSL1	65	61	68	65	53
NSL2	65	54	59	57	51
NSL3	65	57	65	62	51
NSL4	65	55	58	57	54
NSL5	65	54	56	55	54
NSL6	65	54	56	55	54
NSL7	65	54	56	55	54
Phase 1A	65	55	57	56	54
Phase 1B	65	55	58	56	54

Location	Noise Limit dB (A)	Predicted noise level (construction noise + ambient) with no mitigation L _{Aeq} , dB			
		Site Set Up	Substructure	Superstructure	External Finishes
Phase 2A	65	55	62	59	50
Phase 2B	65	57	64	61	50
Phase 3A	65	64	71	68	55

The assessment considers distances measured from the centre of the nearest construction phase to each NSL. However, it is acknowledged that some construction activities will occur closer to the site boundaries, potentially resulting in higher noise levels at the sensitive receptors. Therefore, noise mitigation measures are recommended throughout all stages of construction to control noise and vibration emissions during the construction phase. A combination of the mitigation measures outlined in Section 10.6.1.1 shall be implemented to control construction noise levels at the NSLs.

10.5.2.1.3 Traffic from Construction Vehicles

This section outlines the potential noise effect from construction vehicles on the surrounding road network.

According to figures and information provided by Pinnacle Consulting Engineers, and outlined in Table 10-15 and Table 10-26 the traffic levels will not increase by more than 25% which would equate to an increase of 1dB in traffic noise levels. Therefore, there will be no additional noise effect from construction vehicles. Table 10-15 outlines the construction traffic and percentage impact on the existing road network detailed in Figure 10-5.

Table 10-15: Construction Traffic AADT Figures.

Construction					
Site	Trip Distribution	AADT 2030 (Do Nothing)	Construction Flows	HGV	% Impact
1	0.00%	22628	0	0	0.00%
2	0.00%	8193	0	0	0.00%
3	0.00%	13529	0	0	0.00%
4	0.00%	14410	0	0	0.00%
5	100.00%	5218	810	81	15.52%
6	100.00%	15662	810	81	5.17%
7	100.00%	19825	810	81	4.09%

Construction					
Site	Trip Distribution	AADT (Do Nothing) 2030	Construction Flows	HGV	% Impact
8	0.00%	16376	0	0	0.00%

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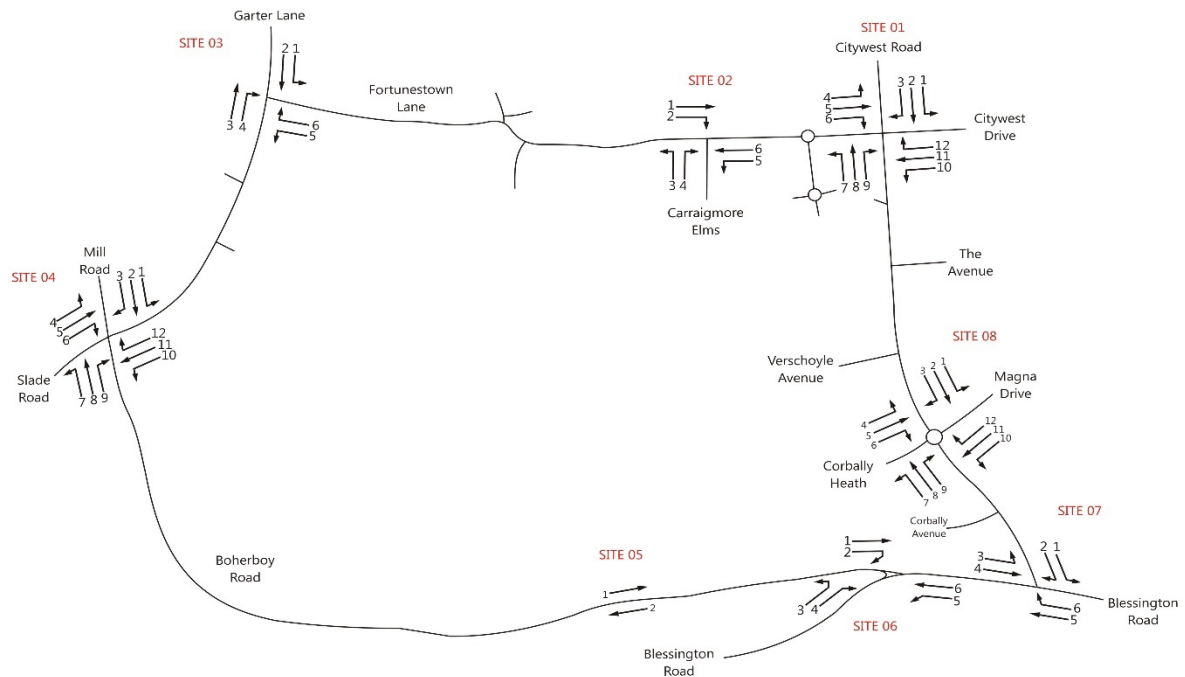


Figure 10-5: AADT Traffic Legend.

Table 10-16 outlines the magnitude of effects associated with changes in traffic noise levels.

Table 10-16 Magnitude of Effects

Noise Change, dB	Magnitude of Impact
0	No Change
0.1 – 2.9	Negligible
3 – 4.9	Minor
5 – 9.9	Moderate
10+	Major

10.5.2.1.4 Conclusion of Unmitigated Noise Effects -Construction Phase

Based on the construction noise assessment, the Proposed Developments construction phase is expected to have a significant and temporary effect from on-site noise, as noise levels will

exceed project criteria without mitigation. This conclusion is based on a binary judgment of significance, acknowledging that while the effect is temporary, its magnitude requires a clear and definitive classification. Regarding construction traffic, the projected increase in vehicle usage is considered minimal and is not expected to cause a perceptible or significant increase in noise levels on the surrounding road network. To address the significant on-site noise and vibration impacts, mitigation measures developed and outlined in Section 10.6.1 will be incorporated into the Construction Environmental Management Plan (CEMP), detailing the necessary mitigation measures to ensure that the overall effects of construction are properly managed and reduced to acceptable levels. Table 10-17 outlines the summary of unmitigated construction phase noise effects.

Table 10-17 Summary of Construction Phase Effects Pre Mitigation

Quality	Significance	Duration	Type
Neutral	Significant	Temporary	Noise

10.5.2.2 Construction Phase – Vibration

The Dublin Agglomeration Noise Action Plan 2024-2028 does not contain guidance relating to vibration limits. Best practice guidance is taken from British Standard BS 5228:2009+A1 2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 2 Vibration.

The standard recommends that for a soundly constructed residential property and similar structures (in good repair), the threshold for minor or cosmetic (i.e. non-structural) damage should be taken as a Peak Particle Velocity (PPV) (in frequency range of predominant pulse) of 15mm/s at 4Hz increasing to 20mm/s at 15Hz and 50mm/s at 40Hz and above. Allowable vibration (in terms of peak particle velocity) at the closest part of sensitive property to the source of vibration is outlined in Table 10-18:

Table 10-18 Allowable Vibration Limits

Allowable vibration (in terms of peak particle velocity) at the closest part of sensitive property to the source of vibration, at a frequency of:			
Building Type	Less than 15Hz	15 to 40Hz	40Hz and above
Light framed structures/ residential buildings	15 mm/s	20 mm/s	50 mm/s

10.5.2.2.1 Construction Vibration Predictions

Vibration effect is not anticipated for most of the construction stage, however some vibration is expected to be generated during the substructure stage where activities such as piling and earthworks are likely to occur. During this phase, compliance with vibration criteria is evaluated using a combination of measured data and general estimates, as predicting vibration effects over distance is challenging due to variations in soil composition and ground conditions. While precise predictions are difficult to achieve, general estimates based on measured vibration levels at specific distances, as outlined in BS 5228-2, provide a practical method for assessing potential effects, as outlined in Table 10-18.

10.5.2.2.2 Conclusion of Unmitigated Vibration Effects – Construction Phase

Based on the environmental assessment, the Proposed Developments construction phase is expected to have a temporary effect from on-site vibration. While the potential for vibration exists, the magnitude of these effects is not anticipated to reach a level that would be considered significant without mitigation. This conclusion is based on a binary judgment of significance—an effect is either significant, or it is not—and indicates that vibration is not a major concern for the Proposed Development. To address any potential nuisance from vibration, a Construction Environmental Management Plan (CEMP) will be implemented, detailing the necessary management measures to ensure that the overall effects of construction are properly managed and minimized. Table 10-19 outlines the summary of unmitigated construction phase vibration effects.

Table 10-19 Summary of Construction Phase Effects Pre Mitigation

Quality	Significance	Duration	Type
Neutral	Slight	Temporary	Vibration

10.5.3 Operational Phase

10.5.3.1 Operational Phase Noise Limits

The main potential source of operational noise from the Proposed Development is plant and equipment, traffic movements, car parking, crèche play area and external/public amenity spaces.

The Dublin Agglomeration Noise Action Plan 2024-2028 does not specify any operational noise limits, typically most councils define these in line with guidance from EPA NG4: Guidance Note for Noise: License Applications, Surveys and Assessments in Relation to Scheduled Activities:

- Daytime 55 dB (A) L_{eq} ; and
- Night-time 45 dB (A) L_{eq} (or exceptionally 40 dB (A) L_{eq}).

In order to assist with the interpretation of the noise associated with vehicular traffic on public roads, Table 10-20 offers guidance as to the likely effect associated with any particular change in traffic noise level (Source: DMRB, 2011).

Table 10-20 Magnitude of Impacts

Noise Change, dB	Magnitude of Impact
0	No Change
0.1 – 2.9	Negligible
3 – 4.9	Minor
5 – 9.9	Moderate
10+	Major

10.5.3.1.1 BS 4142: Methods for Rating and Assessing Industrial and Commercial Sound.

BS 4142 states that and exceedance of the noise source of the background noise by:

- +10 dB or more indicates that complaints are likely;
- + 5 dB is of marginal significance; and
- The rating level is more than 10 dB below the measured background noise level, then this is a positive indication that complaints are unlikely.

BS4142 outlines guidance for penalty corrections to be applied to the noise sources in question should the noise source have one of the following characteristics:

- The noise contains a distinguishable, discreet, continuous tone (whine, or hum);
- The noise contains distinct impulses (i.e. bangs);
- The noise is intermittent; or
- The noise is irregular.

10.5.3.1.2 EPA NG4: Guidance note to Noise: License Applications, Surveys and Assessments in Relation to Scheduled Activities.

EPA NG4 outlines that noise attributable solely to onsite activities from a licenced premises should not exceed the following limits:

- Daytime (07:00hrs – 19:00hrs) – 55dB $L_{Ar,T}$;
- Evening (19:00hrs – 23:00hrs) – 50dB $L_{Ar,T}$; and
- Nighttime (23:00hrs – 07:00hrs) – 45dB $L_{Aeq,T}$.

“During daytime and evening periods rigorous efforts should be made to avoid clearly audible tones and impulsive noise at all sensitive locations. A penalty of 5dB for tonal and/or impulsive elements is to be applied to the daytime and evening measured $L_{Aeq,T}$ values to determine the appropriate rating level ($L_{Ar,T}$). In all cases, an assessment by a competent person will be required.

During the night-time period no tonal or impulsive noise from the facility should be clearly audible or measurable at any NSL.”

10.5.3.2 Operational Phase Inward Noise

10.5.3.2.1 ProPG: Professional Practice Guidance on Planning & Noise

ProPg 2017 is used to assess airborne noise from transport sources including road, rail and aircraft noise. The aim of the document is to provide a good design process which considers the internal acoustic environment at an early stage in the design process. The guidance was prepared by the Institute of Acoustics, the Association of Noise Consultants and the Chartered Institute of Environmental Health and is based on the findings by the World Health Organisation in relation to noise effect on humans. Its adoption is considered best practice for assessing the potential noise effect on the future occupants for residential developments.

The guidance is primarily designed for residential developments however it can be applied to other development types including developments where people require appropriate noise levels for rest and sleep. This includes residential care homes, hospitals etc. The guidance

advocates a holistic design process which considers the site, its location and likely suitability for the development at an early stage.

The two primary stages of the ProPG design approach are summarised as follows:

Stage 1 – The first stage is to undertake an initial high-level noise risk assessment of the proposed site considering the noise levels (measured and or predicted) to identify any noise risks. This would include consideration of the current noise environment, future use and future noise levels; and,

Stage 2 –The second stage is a full detailed assessment of the proposed development covering the “Four Key Elements”:

- “Good Acoustic Design Process,
- Internal Noise Level Guidelines,
- External Amenity Area Noise Assessment; and
- Assessment of Other Relevant Issues.”

Following the ProPg the following conclusions are recommended by ProPG in relation to the findings of the Acoustic Design Statement based one the recommendations of the Acoustic Consultant:

“Planning consent may be granted without any need for noise conditions;”

“Planning consent may be granted subject to the inclusion of suitable noise conditions; “

“Planning consent should be refused on noise grounds in order to avoid significant adverse effects (“avoid”); or, “

“Planning consent should be refused on noise grounds in order to prevent unacceptable adverse effects (“prevent”).

Section 3 of the ProPG outlines the recommended approach decision makers should following in coming to their conclusions based on the recommendations of the Acoustic Design Statement. Figure 10-6 illustrates the ProPG approach.

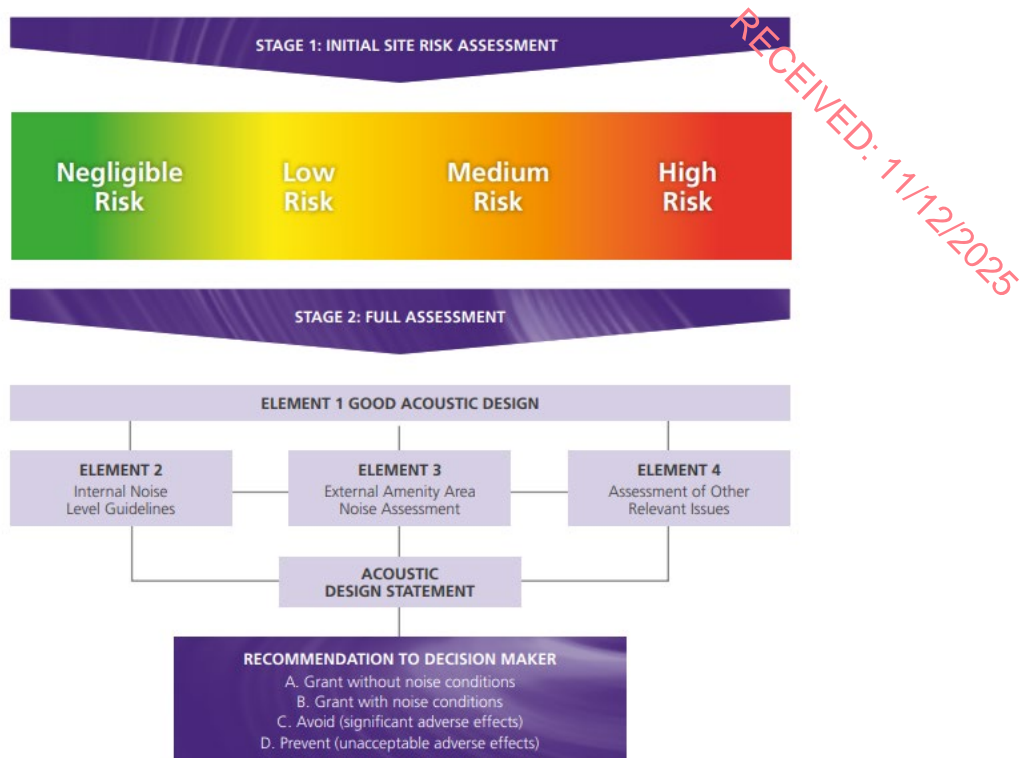


Figure 10-6: Summary of overall Propg approach

10.5.3.2.2 Internal Noise Levels

Table 10-21 below outlines the internal noise levels from BS 8233:2014 within living accommodation for residential buildings for dining, resting and sleeping. These limits are in line with the ProPG and the World Health Organisation Guidelines.

Table 10-21 BS 8233:2014 internal noise criteria –Residential Buildings

Activity	Location	07:00 to 23:00 Hrs	23:00 to 07:00 Hrs
Resting	Living Room	35 dB LAeq, 16 hour	-
Dining	Dining Room/Area	40 dB LAeq, 16 hour	-
Sleeping (daytime resting)	Bedroom	35 dB LAeq, 16 hour	30 dB LAeq, 8 hour 45dB LAFmax ¹

¹ Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or LAmax,F, depending on the character and number of events per night. Sporadic noise events could require separate values. In most circumstances in noise sensitive rooms at night (e.g. bedrooms) good acoustic design can be used so that individual noise events do not normally exceed 45dB LAFmax more than 10 times a night

10.5.3.2.3 External Amenity Space Noise Levels

With regard to noise levels in external amenity spaces ProPG 2017 refers to the BS8233:2014 guidance which states that:

“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”.

It also states that:

“These guideline values may not be achievable in all circumstances where development might be desirable. In such a situation, development should be designed to achieve the lowest practicable noise levels in these external amenity spaces but should not be prohibited.”

After mitigation/with mitigation if the adverse noise effect are still above the recommended noise levels they can be offset by providing an alternative amenity space to partially offset the noise effect by providing access to:

- *“a relatively quiet facade (containing openable windows to habitable rooms) or a relatively quiet externally ventilated space (i.e. an enclosed balcony) as part of their dwelling; and/or*
- *a relatively quiet alternative or additional external amenity space for sole use by a household, (e.g. a garden, roof garden or*
- *a relatively quiet, protected, nearby, external amenity space for sole use by a limited group of residents as part of the amenity of their dwellings; and/or*
- *a relatively quiet, protected, publicly accessible, external amenity space (e.g. a public park or a local green space designated because of its tranquillity) that is nearby (e.g. within a 5 minutes walking distance). The local planning authority could link such provision to the definition and management of Quiet Areas under the Environmental Noise Regulations.”*

BS 8233:2014 elaborates on this further, it acknowledges that it may not always be necessary or feasible to ensure that noise levels remain within the guideline values. In respect of gardens and patios, BS 8233:2014 states:

“however it is also recognized that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces but should not be prohibited.”

Both BS8233:2014 and ProPG 2017 do not advise that development should be restricted in areas with undesirable noise levels. The standards recommend that mitigation measures are put in place where practicable to achieve the recommended noise levels for the external amenity spaces. It notes that this may not be practical in all situations and local or governmental policy should take precedence in these situations.

10.5.3.3 Operational Noise - Predictions

This section outlines the predicted noise effect of the operational phase of the Proposed Development on the surrounding sensitive locations.

10.5.3.3.1 Plant Noise

Operational external mechanical plant and equipment associated with residential units has not yet been confirmed. In the absence of information regarding the operational plant at this planning stage the approach has been taken to determine suitable operational noise emission limits.

The closest NSL to the proposed development site is NSL5. The closest representative noise monitoring location to NSL 5 is noise monitoring location A2.

To be reflective of a worst-case scenario, the lowest LA90 measurements from the daytime LA90, 1hour (07:00-23:00) and night-time LA90, 15min (23:00-07:00) at noise monitoring location A2 have been used to determine suitable operational noise emission limits.

Table 10-22 contains the daytime and nighttime noise threshold limit to be adhered to for any plant and equipment noise from the proposed development at the nearest noise sensitive locations.

Table 10-22: Derived Noise Threshold Limits for Plant & Equipment Noise.

Noise Sensitive Location	Background Sound Levels LA90 dB	Penalty for Tonality dB(A)	Derived Noise Threshold Limit dB(A) Leq at Noise Sensitive Receptors
1	45 (Daytime)	TBC	45
	35 (Night-time)	TBC	35
2	45 (Daytime)	TBC	45
	35 (Night-time)	TBC	35
3	45 (Daytime)	TBC	45
	35 (Night-time)	TBC	35
4	45 (Daytime)	TBC	45
	35 (Night-time)	TBC	35
5	45 (Daytime)	TBC	45
	35 (Night-time)	TBC	35
6	45 (Daytime)	TBC	45
	35 (Night-time)	TBC	35

Noise Sensitive Location	Background Sound Levels LA90 dB	Penalty for Tonality dB(A)	Derived Noise Threshold Limit dB(A) Leq at Noise Sensitive Receptors
7	45 (Daytime)	TBC	45
	35 (Night-time)	TBC	35

At detailed design stage mitigation measures, if required, may need to be incorporated into the design of external mechanical plant and equipment if applicable.

10.5.3.3.2 Plant Noise - Unmitigated Noise Effects

The plant and equipment specification for the Proposed Development is not available at the time of writing and will be further developed at design development stage. This chapter and assessment outlines noise limits at the surrounding noise sensitive receptors that must be adhered to in order to remain in compliance with project criteria and to protect the existing amenity of the surrounding noise sensitive receptors.

Mitigation measures, if required, to control the noise emissions of any plant and equipment will be developed at design development stage once the final plant and equipment specification is known.

10.5.3.3.3 Crèche Play Area

The Proposed Development features a 2 storey crèche and associated play area to the north of the Proposed Development. Noise levels from the crèche play area during operation have been assessed based on measured noise levels from similar play areas and incorporated into the noise model. By leveraging data from a comparable environment, the assessment benefits from established baseline measurements which provide insight into typical acoustics properties of outdoor play areas.

In addition to the measured noise data, the crèche play area has been assigned an on-time in the model which assumes 3 hours of daily outdoor play for the crèche. Table 10-23 outlines the sound power spectrum used in the assessment.

Table 10-23 Play Area Sound Power Levels

Description	Octave Band Sound Power Level Lw dB at Centre Frequency (Hz)								Overall Sound Power Level LWA dB
	63	125	250	500	1000	2000	4000	8000	
Measured play area noise levels	80	77	75	76	75	71	65	55	79

10.5.3.3.4 Creche Play-Area – Unmitigated Noise Effect

The operational noise from the crèche play area has been assessed using measured data from a similar environment. The noise model, which assumes three hours of daily outdoor play, indicates that the effects of the crèche will be neutral in quality and imperceptible in

significance. This is because the noise generated is comparable to typical background sounds and does not cause a noticeable change in the acoustic environment. The effect is likely to occur and will be permanent throughout the crèche's operational life. However, based on the assessment, the overall effect is concluded to be not significant.

10.5.3.3.5 External Amenity Space

This section outlines the external amenity noise levels used for the assessment. Guidance has been sought from Association of Australasian Acoustical Consultants (AAAC): Licensed Premises Noise Assessment Technical Guideline, V 2.0 for vocal noise spectrums and assessment parameters. The standard offers industry leading guidance on the assessment of groups of persons in various venues and scenarios. Table 10-24 outlines the vocal effort spectra used in the assessment in sound power format with each spectrum accounting for 2 persons speaking in a group of 6, this is in line with the AAAC guideline which assumes 1 in 3 persons speaking simultaneously.

Table 10-24 Patron Vocal Effort in Sound Power

Description	Octave Band Sound Power Level L _w dB at Centre Frequency (Hz)								Overall Sound Power Level L _{WA} dB
	63	125	250	500	1000	2000	4000	8000	
Normal Vocal Effort (Male)	56	58	67	69	63	59	55	50	69
Raised Vocal Effort (Male)	66	67	74	76	73	68	63	57	77

Occupancy of each external amenity space has been assumed for the purposes of the assessment. The assumed occupancy of each public open space is outlined in Table 10-25.

Table 10-25: Public and Communal Open Space Occupancy Figures.

Space	Occupancy (Persons)
POS 1	18
POS 2	24
POS 3	24
POS 4	32
POS 5	18
POS 6	18
POS 7	24
POS 8	18
POS 9	12
POS 10	6
POS 11	12
POS 12	6
Block B1-C1 COS	24
5 Storey Apt Block COS	18
Block A1 COS	12
Duplex Block B COS	12
Duplex Block A COS	6

10.5.3.3.6 External Amenity – Unmitigated Noise Effect

The assessment of external amenity noise has used established guidelines from the Association of Australasian Acoustical Consultants (AAAC) to model noise from groups of people. This assessment, which assumes a permanent and continuous effect, uses a vocal effort spectrum that accounts for two out of every six people speaking at any given time. While this effect is likely to occur, the quality of the noise is considered neutral and its significance is deemed imperceptible to the surrounding environment. As a result, the noise from the external amenity areas is concluded to be not significant.

10.5.3.3.7 Proposed School

The development allocated c. 1 Ha of land for a future school to inhabit. As part of the future planning application for the school it is recommended an operational noise impact assessment is conducted to assess the impact on the NSLs to ensure the amenity of the residents is protected.

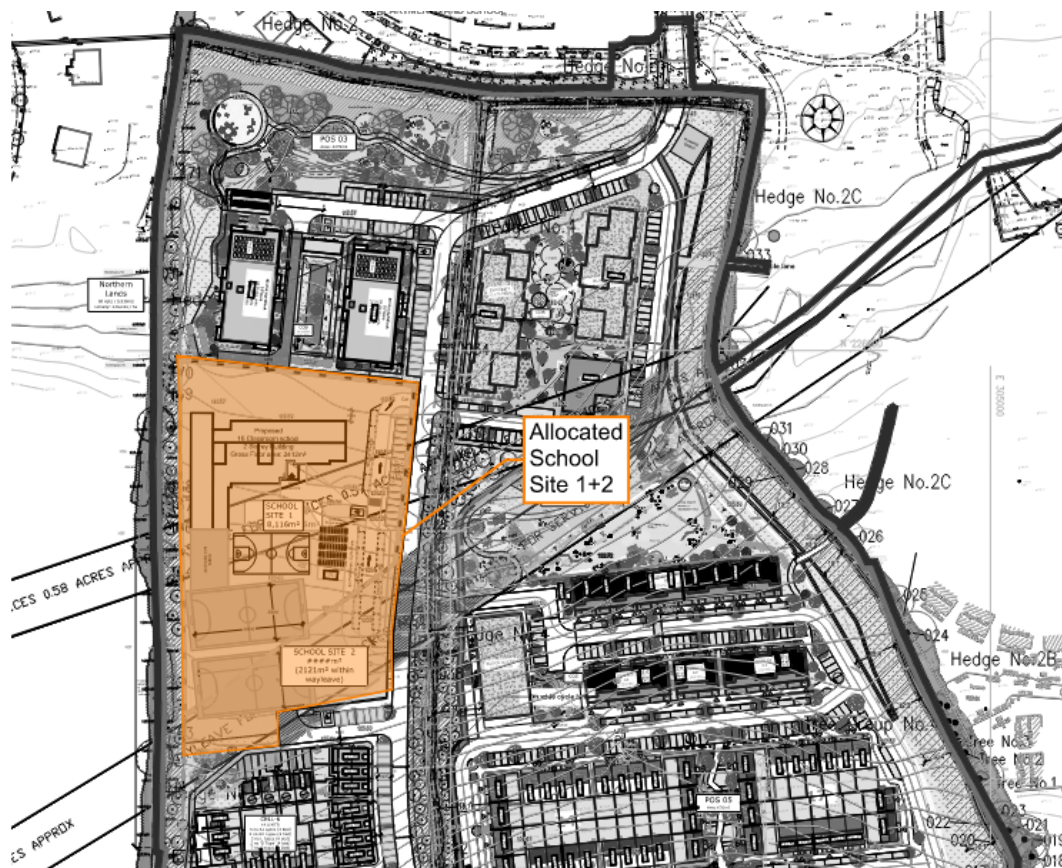


Figure 10-7 Proposed School Site 1 and Site 2 (Ref: 25.09.26_Boherboy Site Layout Plan 1-1000)

10.5.3.3.8 Operational Traffic

Operational phase traffic volumes have been provided by Pinnacle Consulting Engineers (2025) in Chapter 14: Material Assets: Traffic. Table 10-26 outlines the operational traffic volumes for the do-nothing scenario and development flows for the year 2032. Based on the percentage impact, the additional traffic generated by the development does not exceed and increase off 25% which would equate to a 1dB increase in noise levels due to traffic changes.

The additional traffic generated by the proposed development will not lead to a significant increase in noise or contribute to adverse noise impact on surrounding sensitive receptors.

Table 10-26 Operational Phase Traffic AADT Figures.

Site	Operational				
	Trip Distribution	AADT (Do Nothing) 2032	Development Flows	HGV	% Impact
1	16.72%	22841	1054	0	4.61%
2	21.53%	8270	1357	0	16.41%
3	4.81%	13657	303	0	2.22%
4	3.68%	14546	232	0	1.60%
5	6.81%	5267	429	0	8.15%
6	1.91%	15810	120	0	0.76%
7	12.27%	20012	773	0	3.86%
8	32.27%	16530	2034	0	12.30%

10.5.3.3.9 Operational Traffic Predictions

The Design Manual for Roads and Bridges (DMRB) states that a 25% increase in traffic flow typically results in an increase of approximately 1 dB(A) in road traffic noise levels, assuming all other variables remain constant. As shown in outlined in Table 10-26, projected traffic flow increases associated with the Proposed Development under the Development Flows section are all significantly below this threshold. The greatest increase is a 16.41% rise along link 2 further indicated in Figure 10-5, representing a worst-case scenario. All other links are subject to lower traffic increases and, consequently, lower associated noise impacts. Therefore, the predicted change in traffic noise levels across the study area is expected to be no greater than approximately 1 dB(A), which is generally considered barely perceptible and not significant under standard noise impact assessment criteria.

It is generally accepted that it takes an approximate 3dBA increase in noise levels to be perceptible to the average person (Ref: Planning Policy Guidance Note 24 PPG24 - Planning and Noise).

Traffic levels along the site access road are expected to increase substantially, as the baseline traffic levels recorded during the base year survey were very low. However, when compared to the traffic volumes on the surrounding road network, the increase from base year to the design year is expected to have a minimal effect on the overall noise levels in the surrounding area.

As such, operational traffic noise levels associated with the Proposed Development will not have a negative effect on NSLs.

Table 10-27 Magnitude of Change

Noise Change, dB	Magnitude of Impact
0	No Change

Noise Change, dB	Magnitude of Impact
0.1 – 2.9	Negligible
3 – 4.9	Minor
5 – 9.9	Moderate
10+	Major

10.5.3.3.10 Operational Phase Traffic – Unmitigated Noise Effect

Based on the noise assessment, the predicted changes in operational traffic noise levels associated with the proposed development are concluded to be not significant. This determination is based on a number of factors. The worst-case scenario, a 16.41% increase in traffic along link 2, is expected to cause a change of less than 1 dB(A). This change is considered imperceptible to the average person, as it falls well below the 3 dB(A) increase typically required for human perception. Therefore, the effects are assessed as neutral in quality and imperceptible in significance. While these changes are likely to occur and will be permanent, their lack of a discernible impact means the overall conclusion is one of no significant effect.

10.5.3.3.11 Car Parking

The Proposed Development includes a significant number of car parking spaces for each dwelling and duplex block as well as road side parking for the apartment buildings.

The car parking has been incorporated into the assessment and will be of such short duration and low frequency as to not contribute significant noise effect on the surrounding noise sensitive receptors.

10.5.3.4 Daytime Noise Effect

As the Proposed Development has the potential to generate noise with different characteristics for both the daytime and night-time periods, a model has been undertaken for both the day and night-time operational situations of the Proposed Development. The operational noise assessment takes into consideration the specific sources operating on the development such the public and communal open spaces and crèche outdoor play area as indicated in Figure 10-8. Traffic and car parking has been assessed separately and found to not have any significant effect on the surrounding sensitive receptors as outlined in Section 10.5.3.3.9.4.7 and 10.5.2.4.8.



Figure 10-8 Screenshot of Model Displaying the Operational Phase Assessment

The daytime (07:00 – 23:00) situation assumes the following noise sources, the assumptions are based on similar other developments and WDAs experience:

- External amenity (POS and COS) operational from the hours of 16:00-23:00 based on persons speaking with normal vocal effort and occupancy as outlined in Section 10.5.3.3.5.
- Creche outdoor play area operational for 3 hours per day during the hours of 08:00-18:00.

10.5.3.4.1 BS 4142 Noise Effect Assessment (Daytime 07:00 – 23:00)

The noise effects at the nearest Noise Sensitive Locations (NSL1–NSL7) have been assessed in accordance with the methodology set out in BS 4142:2014+A1:2019, which provides a framework for assessing industrial and commercial sound in relation to background sound levels. In accordance with BS 4142, the daytime period is defined as 07:00 to 23:00 hours, and this time frame has been applied in the assessment of potential noise effects.

Table 10-28 outlines the assessment at the closest NSL (NSL7), which is the worst-case receptor due to its proximity to the Proposed Development. All NSLs have been assessed and are predicted to have lower onset noise levels than NSL4.

The residual and background noise levels were taken from the unattended logger positions and averaged across the entire measurement period; this is indicative of all typical noise climates in the surrounding area. In BS 4142, residual sound is defined as the ambient sound that remains when the specific sound under assessment is suppressed or removed.

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Table 10-28 Noise Effect During Daytime Hours

Results		Relevant BS 4142 Clause	Commentary
Predicted specific sound level (daytime)	$L_{Aeq(60min)} = 31dB$	7.3.6	As the Proposed Development is not yet existing, noise levels have been predicted using SoundPlan modelling software. Worst case specific sound predicted at NSL4.
Residual sound level (daytime)	$L_{Aeq(16,hour)} = 54dB$	7.3.2	The residual sound level was dominated by road traffic noise on surrounding roads. Background noise from measurement location L1 was assessed as this is representative for worst case receptor NSL4.
Background sound level (daytime)	$L_{A90(16,hour)} = 47dB$	8.1.2 8.4	The L_{A90} sound level was measured at the noise sensitive location with the source absent.
Assessment made during the daytime, so the reference time interval is 1 hour		7.2	
Specific sound level as predicted	$L_{Aeq(60min)} = 31dB$	7.3.6	The specific sound has been predicted by calculation alone as the Proposed Development is not existing at the time of the survey.
Acoustic feature correction	+0dB	9.2 9.3.2	It is not anticipated that the specific sound will have any impulsive, tonal or intermittent characteristics.
Rating level	$(31 + 0) dB = 31dB$	9.2	
Background sound level	$L_{A90(16,hour)} = 47dB$	8	
Excess of rating over background sound level	$(31 - 47) dB = -16dB$	11	Assessment indicates that no adverse effect is likely on the noise sensitive locations as the specific sound is 16dB below the background levels and is lower than the residual sound. Context has also been considered.
Uncertainty of the assessment	Not significant	10	The specific sound is a worst-case prediction as the assessment assumes a worst-case operational scenario. The assessed specific sound is the worst-case prediction to NSL4.

10.5.3.4.2 Consideration of Tonality and Impulsivity

The assessment for tonality and impulsivity has determined that the noise emissions from the proposed development are lower than the existing background and residual noise levels. As a result, the emissions are unlikely to have an effect at the Noise Sensitive Locations (NSLs) or produce any tonal or impulsive characteristics. The quality of the effect is considered neutral, with a significance that is imperceptible. This is a permanent and continuous effect, but because it will not cause any noticeable change in the acoustic environment, the overall conclusion is not significant.

10.5.3.4.3 EPA NG4

NG4 recommends a daytime noise criterion of 55 dB $L_{Ar,T}$ (07:00–19:00 hrs) for assessing industrial and commercial noise in areas of low background sound levels. At NSL4, the predicted noise emissions from the Proposed Development during daytime hours are 31 dB $L_{Aeq,T}$, with no identified tonal or impulsive characteristics. As such, when applying a rating level in accordance with BS 4142:2014+A1:2019, no penalty is warranted. Therefore, the predicted noise levels at NSL5 are expected to remain well below the NG4 criterion, and compliance with the guidance is anticipated. Table 10-29 outlines the predicted noise effect at each noise sensitive location, the project criteria and compliance with the project criteria.

Table 10-29 Operational Noise Levels at Each Sensitive Receptor

Noise Sensitive Location	EPA NG4 Daytime Criteria $L_{Ar,T}$ dBA	Predicted Noise Level from the Proposed Development $L_{eq,T}$ dBA
NSL1	55	29
NSL2	55	19
NSL3	55	23
NSL4	55	31
NSL5	55	23
NSL6	55	28
NSL7	55	20

10.5.3.4.4 Overall Day-time Noise Effect

Based on the operational noise assessment, the proposed development's effects are considered not significant across all assessed sources.

The noise from the crèche play area and external amenity spaces is assessed as having a neutral quality and an imperceptible significance at nearby sensitive locations. These are permanent and continuous effects that are likely to occur, but the modelling, which incorporates operational hours and a vocal effort spectrum, demonstrates that the resulting noise levels will not cause a noticeable change in the acoustic environment.

Regarding operational traffic noise, the overall effect is concluded to be not significant. While traffic on the new access road will increase substantially, its impact is minimal when compared to the existing wider road network. The worst-case scenario, a 16.41% increase in traffic on link 2, is predicted to cause a change of less than 1 dB(A), which is considered imperceptible to the average person. Therefore, the effect is neutral and not significant. Similarly, noise from car parking is considered not significant due to its short duration, isolated nature, and imperceptible effect on NSLs.

10.5.3.5 Night-time Noise Effect

At night-time, the Proposed Development may generate noise with different characteristics compared to daytime operations. The noise model for the night-time scenario focuses on sources expected to operate during this period. Traffic and car parking has been assessed separately and found not have any significant effect on the surrounding sensitive receptors as outlined in Section 10.5.3.

The nighttime (23:00 – 07:00) situation assumes the following noise sources:

- External amenity (POS and COS) operational from the hours of 23:00-01:00 based on persons speaking with normal vocal effort and occupancy as outlined in Section 10.5.3.3.5.
- Creche assumed to not operate during the nighttime period.

10.5.3.5.1 BS 4142 Noise Effect Assessment (Night-time 23:00 – 07:00)

The noise effect at the nearest NSLs (NSL1-NSL7) has been assessed in accordance with BS4142. Table 10-30 outlines the assessment at the closest NSL (NSL4), which is the worst-case receptor due to its proximity to the Proposed Development. All other NSLs have been assessed and are predicted to have lower onset noise levels than NSL4. The residual and background noise levels were taken from the unattended logger positions and averaged across the entire measurement period; this is indicative of all typical noise climates in the surrounding area.

Table 10-30 Noise Effect During Nighttime Hours

Results		Relevant BS 4142 Clause	Commentary
Predicted specific sound level (nighttime)	$L_{Aeq(15min)} = 28dB$	7.3.6	As the Proposed Development is not yet existing, noise levels have been predicted using SoundPlan modelling software. Worst case specific sound predicted at NSL4.
Residual sound level (nighttime)	$L_{Aeq(8,hour)} = 45dB$	7.3.2	The residual sound level was dominated by road traffic noise on surrounding roads. Background noise from measurement location L1 was assessed as this is representative for worst case receptor NSL4.
Background sound level (nighttime)	$L_{A90(8,hour)} = 35dB$	8.1.2 8.4	The L_{A90} sound level was measured at the noise sensitive location with the source absent.

Results		Relevant BS 4142 Clause	Commentary
Assessment made during the daytime, so the reference time interval is 1 hour		7.2	
Specific sound level as predicted	$L_{Aeq(15min)} = 28dB$	7.3.6	The specific sound has been predicted by calculation alone as the Proposed Development is not existing at the time of the survey.
Acoustic feature correction	+0dB	9.2 9.3.2	It is not anticipated that the specific sound will have any impulsive, tonal or intermittent characteristics.
Rating level	$(28 + 0) dB = 28dB$	9.2	
Background sound level	$L_{A90(8, hour)} = 35dB$	8	
Excess of rating over background sound level	$(28 - 35) dB = -7dB$	11	Assessment indicates that no adverse effect is likely on the noise sensitive locations as the specific sound is 7dB below the background levels and is lower than the residual sound. Context has also been considered.
Uncertainty of the assessment	Not significant	10	The specific sound is a worst-case prediction as the assessment assumes a worst-case operational scenario. The assessed specific sound is the worst-case prediction to NSL4.

10.5.3.5.2 Consideration of Tonality and Impulsivity

The assessment for tonality and impulsivity has determined that the noise emissions from the proposed development are lower than the existing background and residual noise levels. As a result, the emissions are unlikely to have an effect at the Noise Sensitive Locations (NSLs) or produce any tonal or impulsive characteristics. The quality of the effect is considered neutral, with a significance that is imperceptible. This is a permanent and continuous effect, but because it will not cause any noticeable change in the acoustic environment, the overall conclusion is not significant.

10.5.3.5.3 EPA NG4

NG4 recommends a nighttime criterion of (23:00hrs – 07:00hrs) 45dB $L_{Aeq,T}$, in areas of low background noise, the predicted noise emissions from the development are 28 dBA at NSL4, with no tonality or impulsivity, therefore the NG4 criteria is expected to be achieved. Table 10-31 outlines the predicted noise effect at each noise sensitive location, the project criteria and compliance with the project criteria.

Table 10-31 Operational Noise Levels at Each Sensitive Receptor

Noise Sensitive Location	EPA NG4 Nighttime Criteria L _{Aeq,T} dBA	Predicted Noise Level from the Proposed Development L _{eq,T} dBA
NSL1	45	27
NSL2	45	17
NSL3	45	18
NSL4	45	28
NSL5	45	21
NSL6	45	25
NSL7	45	17

10.5.3.5.4 Overall Night-time Noise Effect

Based on the operational noise assessment, the proposed development's effects are considered not significant across all assessed sources.

The noise from the crèche play area is assumed not operational during the night-time and external amenity spaces is assessed as having a neutral quality and an imperceptible significance at nearby sensitive locations. These are permanent and continuous effects that are likely to occur, but the modelling, which incorporates operational hours and a vocal effort spectrum, demonstrates that the resulting noise levels will not cause a noticeable change in the acoustic environment.

Regarding operational traffic noise, the overall effect is concluded to be not significant. While traffic on the new access road will increase substantially, its impact is minimal when compared to the existing wider road network. The worst-case scenario, a 16.41% increase in traffic on link 2, is predicted to cause a change of less than 1 dB(A), which is considered imperceptible to the average person. Therefore, the effect is neutral and not significant. Similarly, noise from car parking is considered not significant due to its short duration, isolated nature, and imperceptible effect on NSLs.

10.5.3.5.5 Operational Noise – Conclusion of Unmitigated Effects

Table 10-32 outlines the conclusion of unmitigated noise effects for the operational phase.

Table 10-32 Summary of Operational Phase Effects Pre Mitigation

Quality	Significance	Duration	Type
Neutral	Slight	Long-Term	Noise

10.5.3.6 Operational Phase – Vibration

There are no specific vibration criteria for buildings in Ireland. The vibration criteria for this project are based on BS 5228-2:2009+A1:2014, which provides guidance relating to the assessment of human response to vibration in terms of PPV. Table 10-33 outlines the range of vibration values and the associated potential effects on humans.

Table 10-33 Project Vibration Criteria

Vibration Level, PPV	Effect
0.14 mm/s	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies. At lower frequencies people are less sensitive to vibration.
0.3 mm/s	Vibration might be just perceptible in residential environments.
1 mm/s	It is likely that a vibration level of this magnitude in residential environments will cause complaint.

Vibrations typically become perceptible between 0.15 mm/s to 0.3 mm/s and may become annoying or disturbing at higher magnitudes. Higher levels of vibration are tolerated for single events or events of short duration, particularly during construction projects. For example, groundbreaking or piling can typically be tolerated at vibration levels up to 2.5 mm/s if adequate public relations are in place and timeframes are known.

The Proposed Development is a mixed-use development offering residential, creche and commercial spaces, there are no predicted sources of vibration that will cause significant adverse effect on the surrounding NSLs.

10.5.3.6.1 Vibration – Conclusion of Unmitigated Effects

While no specific Irish vibration criteria exist for buildings, the vibration assessment is based on the accepted guidance from BS 5228-2:2009+A1:2014. The standard assesses human response to vibration in terms of Peak Particle Velocity (PPV). This guidance indicates that vibration may become perceptible in residential environments at levels of approximately 0.3 mm/s and could lead to complaints at higher magnitudes, such as 1 mm/s.

The operational phase of the Proposed Development is not predicted to generate any sources of vibration. The effect is concluded to be neutral in quality and imperceptible in significance. This is a permanent effect, yet its probability of occurrence is unlikely. Therefore, the overall conclusion is that the operational vibration effect on the surrounding Noise Sensitive Locations (NSLs) will be not significant.

10.5.3.7 Inward Noise Impact

The stage one risk assessment is used to assess the site for potential risks that may occur in terms of noise impact. The ProPG sets out four categories of risk: 1) negligible, 2) low, 3) medium or 4) high risk.

The risk assessment also considers the risk based on the number of L_{AFmax} events per night as follows;

- A site should not be considered a negligible risk if more than 10 L_{AFmax} events exceed 60 dB during the night period and;
- A site should be considered a high risk if the L_{AFmax} events exceed 80 dB more than 20 times per night.

Paragraph 2.9 of ProPG states that,

“The noise risk assessment may be based on measurements or prediction (or a combination of both) as appropriate and should aim to describe noise levels over a “typical worst case” 24 hour day either now or in the foreseeable future.”

To assess the noise effect with the ProPG risk categories a baseline noise survey was undertaken on the site to quantify the existing noise environment.

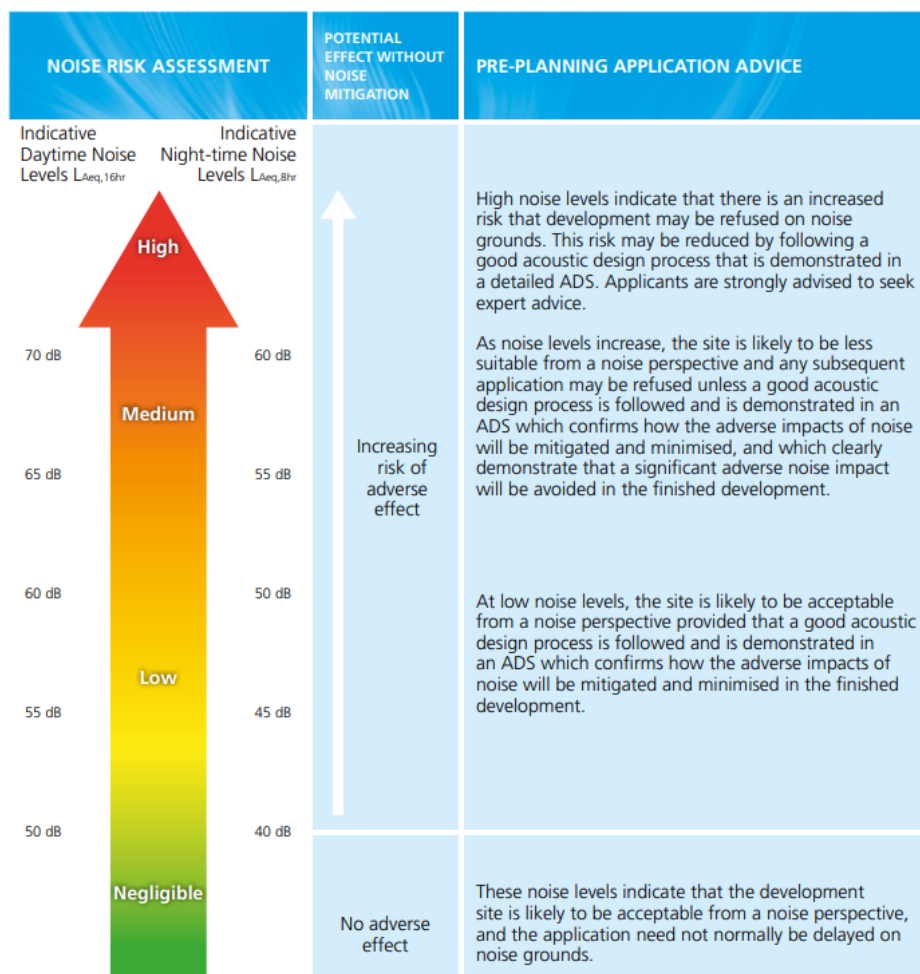


Figure 10-9 Propg Risk Analysis

This section outlines the full acoustic design assessment in line with ProPG guidance.

10.5.3.7.1 Element 1: Good Acoustic Design Progress

ProPg States the following in relation to Good Acoustic Design Process:

“A good acoustic design process takes a multi-faceted and integrated approach to achieve optimal acoustic conditions, both internally (inside noise-sensitive parts of the building(s)) and externally (in spaces to be used for amenity purposes).”

“Good acoustic design should avoid “unreasonable” acoustic conditions and prevent “unacceptable” acoustic conditions (these terms are defined in Element 2). Good acoustic design does not mean overdesign or gold plating of all new development but seeking to deliver the optimum acoustic outcome for a particular site”

The following considerations are recommended by ProPG:

- “Check the feasibility of relocating, or reducing noise levels from relevant sources.
- Consider options for planning the site or building layout.
- Consider the orientation of proposed building(s).
- Select construction types and methods for meeting building performance requirements.
- Examine the effects of noise control measures on ventilation, fire regulation, health and safety, cost, CDM (construction, design and management) etc.
- Assess the viability of alternative solutions.
- Assess external amenity area noise.”

10.5.3.7.2 Discussion of Good Acoustic Design

Mitigation of Sources

The development is located close to road sources which are not on or part of the development therefore it is not possible to reduce or relocate the relevant noise sources.

Site Layout and Orientation

The southern elevation of the development is most exposed to road noise as it is adjacent to Blessington Road and in close proximity to the N81.

Effect of Noise Control Measures

The effects for noise control measures on other building elements including ventilation have been considered. It is generally impractical to provide ventilation via openable windows in urban/built up areas. An open window will provide 10-15dB of attenuation which in built-up urban and suburban areas is not practical. ProPG makes reference to specific cases in suburban areas where the development is beside a transport link. In general, the good acoustic design process in these areas is to provide ventilation via attenuated natural vents or mechanical ventilation. This allows the occupants to have adequate ventilation with adequate noise levels.

External Amenity

ProPG states the following with regard to external amenity spaces:

“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.”

The external amenity source noise levels are considered below.

10.5.3.7.3 Internal Noise Levels

Based on the predicted noise levels at the facades of the proposed development, enhanced glazing will be required on some facades.

10.5.3.7.4 Element 3 - External Amenity Spaces

The external amenity spaces on the development such as public and communal open spaces, gardens and a creche outdoor play area. All public and communal open areas, gardens and the creche outdoor play area are predicted to achieve the recommended desirable noise levels of 55dBA LAeq,16hour.

Based on the measured noise levels at the site and the noise model for the proposed development, it is predicted that the external noise levels across the development achieve the requirements of ProPG Element 3.

10.5.3.7.5 Element 4 - Assessment of Other Relevant Issues

This section of the acoustic design report considered the other relevant issues. Element 4 considers other issues which may remain relevant to the assessment, these issues are as follows:

- 4(i) compliance with relevant national and local policy.
- 4(ii) magnitude and extent of compliance with ProPG .
- 4(iii) likely occupants of the development.
- 4(iv) acoustic design v unintended adverse consequences and;
- 4(v) acoustic design v wider planning objectives.

Compliance with Relevant National and Local Policy

There are no specific noise guidance or policy documents for residential developments. The Dublin Agglomeration Noise Action Plan refers to the ProPG as the relevant document for assessment of the noise effect on new residential developments as followed in this acoustic design statement.

Magnitude and Extent of Compliance with ProPG

This report demonstrates that all dwellings will meet the specified internal noise level requirements provided the guidance in this report is followed. External amenity spaces have been provided in line with the guidance set out in ProPG. Based on this the development is in general compliance with the ProPG requirements.

Likely Occupants of the Development

Additional needs of the future occupants are not known at this stage however the needs of all potential occupants have been considered with the assessment of adequate internal noise

levels and provision of adequate external amenity spaces to meet the needs of potential occupants.

Acoustic Design v Unintended Adverse Consequences

The design has considered the effect of adverse consequences; mitigation has been provided by specification of the sound insulation and ventilation requirements.

Acoustic Design v Wider Planning Objective

Where possible the wider planning objectives have been considered including the need for residential housing with good transport links. It is assumed that the wider planning objectives have been adhered to by following the ProPG guidance.

10.5.3.7.6 Stage 2 Assessment Conclusion

The stage 2 assessment considers all four (4) elements, the principals of good acoustic design have been followed.

The element 2 assessment has considered the measures required to provide an adequate acoustic environment with appropriate noise levels for internal spaces. The sound insulation and ventilation requirements have been specified based on the predicted façade noise levels.

The element 3 assessment of external amenity spaces has considered the noise effect on the development and the external amenity spaces. The appropriate provision of external amenity space has been provided through the use of public and communal open spaces, gardens and a creche outdoor play area which are in line with the ProPG guidance.

Other relevant issues have been considered including, local policy, unintended consequences and the wider planning objectives.

10.5.4 Potential Cumulative Impacts

A review of other off-site developments was completed as part of this assessment. Chapter 2 of this EIA details the existing, proposed and granted planning permissions on record in the area, a review of these planning permissions has been completed as part of this assessment.

The following planning applications have been reviewed as part of this assessment:

SDCC Reg. Ref. 322539 (SD24A/0092W):

The proposed residential scheme is located approximately 240 meters from the proposed development on the lands adjacent to Drury Mills and Drury Park, Swiftbrook, Saggart, Co. Dublin. The development will consist of a residential scheme of 73 no. units comprising a mix of 6 no. houses, 59 no. own-door duplexes and 8 no. apartments arranged in 4 blocks set around a central amenity space. located within the curtilage of protected structures. This is currently a live case and is pending a decision of application Reg. Ref. 322539.

Construction Phase:

The proposed residential scheme is located approximately 240 meters from the boundary of the development in this EIA Chapter. If construction periods for both projects were to run simultaneously, there is a likelihood of combined noise and vibration effects on the surrounding area. However, given the current pending status of the residential application and

the staggered construction phases of the proposed development, it is anticipated that any cumulative impacts will be minimized. This will be ensured by the full implementation of the mitigation measures outlined in this chapter.

Operational Phase:

The cumulative effect of both the proposed development and the residential development will not cause adverse noise or vibration conditions on the surrounding area during the long-term operational phase. This is based on the assumption that both developments will adhere to all relevant noise criteria and that the operational noise and vibration from each will be appropriately managed and controlled. Therefore, the combined effect of both developments is considered to be not significant once they are operational.

SDCC Reg. Ref. 321950 (SD24A/0187W):

The proposed primary care centre is located approximately 590 meters from the proposed development on the lands at Citywest Campus, Garters Lane, Saggart, Co. Dublin. The primary care centre building will provide HSE Services such as general primary care, mental health, disability and older person services. SuDS drainage, PV panels at roof level, signage, landscaping, boundary treatment and all associated site works and services.

Construction Phase:

Given the considerable distance of approximately 590 meters between the two developments, combined with the significant sound attenuation provided by existing buildings and infrastructure, it is unlikely that any cumulative noise and vibration effects will be experienced during the short-term construction phase. This assessment holds true even if both projects' construction periods run simultaneously.

Operational Phase:

During the long-term operational phase, the distance and screening between the two developments will continue to provide effective attenuation. Consequently, there will be no cumulative noise and vibration effects on the surrounding area. The quality of this effect is neutral, its significance is imperceptible, and it is considered to be not significant.

SDCC Reg. Ref. 312501 (TA06S.312501):

The proposed residential scheme is located approximately 710 meters from the proposed development at Mill Road, Saggart, Co. Dublin. The proposed residential scheme will consist of the demolition of an existing dwelling, construction of 274 no. residential units (51 no. houses, 223 no. apartments), creche and associated site works.

Construction Phase:

Given the considerable distance of approximately 710 meters between the two developments, combined with the significant sound attenuation provided by existing buildings and infrastructure, it is unlikely that any cumulative noise and vibration effects will be experienced during the short-term construction phase. This assessment holds true even if both projects' construction periods run simultaneously.

Operational Phase:

During the long-term operational phase, the distance and screening between the two developments will continue to provide effective attenuation. Consequently, there will be no cumulative noise and vibration effects on the surrounding area. The quality of this effect is neutral, its significance is imperceptible, and it is considered to be not significant.

SDCC Reg. Ref. SHD3ABP-310570-21:

The proposed residential scheme is located approximately 800 meters from the proposed development at Cooldown Commons and Fortunestown, Citywest, Co. Dublin. The proposed residential scheme comprising 421 units, offices, retail units x3 and residential amenity areas x2, within 9 blocks ranging in height from 1-13 storeys. The proposal will include 289 car parking spaces along with 650 cycle parking spaces. The development will provide public and communal open spaces throughout including a public plaza adjoining Fortunestown Luas stop. Provision of vehicular, pedestrian, and cyclist accesses to the site, including pedestrian bridge to the public park (under construction) to the east. The application includes for all landscaping, ESB substations, plant areas, bin storage, surface water attenuation and all other site development works, and site services required to facilitate the proposed development. The proposed development seeks to amend SHD permission ABP-302398 -18 (under construction to the west), replacing 32 permitted duplex apartments along with associated amendments to internal roads and open spaces. The current proposal also replaces permission SD16A/0078 previously granted on this site.

Construction Phase:

Given the considerable distance of approximately 800 meters between the two developments, combined with the significant sound attenuation provided by existing buildings and infrastructure, it is unlikely that any cumulative noise and vibration effects will be experienced during the short-term construction phase. This assessment holds true even if both projects' construction periods run simultaneously.

Operational Phase:

During the long-term operational phase, the distance and screening between the two developments will continue to provide effective attenuation. Consequently, there will be no cumulative noise and vibration effects on the surrounding area. The quality of this effect is neutral, its significance is imperceptible, and it is considered to be not significant.

SDCC Reg. Ref. 308088 (TA06S.308088):

The proposed residential scheme is located approximately 910 meters from the proposed development at Garters Lane, Saggart, Co. Dublin. The proposed residential scheme will comprise of 224 no. apartments and associated site works.

Construction Phase:

Given the considerable distance of approximately 910 meters between the two developments, combined with the significant sound attenuation provided by existing buildings and infrastructure, it is unlikely that any cumulative noise and vibration effects will be experienced during the short-term construction phase. This assessment holds true even if both projects' construction periods run simultaneously.

Operational Phase:

During the long-term operational phase, the distance and screening between the two developments will continue to provide effective attenuation. Consequently, there will be no cumulative noise and vibration effects on the surrounding area. The quality of this effect is neutral, its significance is imperceptible, and it is considered to be not significant.

SDCC Reg. Ref. 321696 (SD23A/0336):

The proposed primary school is located approximately 990 meters from the proposed development on the lands south of Coolamber Drive, Rathcoole, Co. Dublin. The proposed primary school (Roll No. 20549P) will include 20 classrooms, with a gross floor area of 3,449 sq.m over 3 storeys.

Construction Phase:

Given the considerable distance of approximately 990 meters between the two developments, combined with the significant sound attenuation provided by existing buildings and infrastructure, it is unlikely that any cumulative noise and vibration effects will be experienced during the short-term construction phase. This assessment holds true even if both projects' construction periods run simultaneously.

Operational Phase:

During the long-term operational phase, the distance and screening between the two developments will continue to provide effective attenuation. Consequently, there will be no cumulative noise and vibration effects on the surrounding area. The quality of this effect is neutral, its significance is imperceptible, and it is considered to be not significant.

SDCC Reg. Ref. 306602 (TA06S.306602):

The proposed residential scheme is located approximately 1.72 kilometers from the proposed development at Citywest Road and Magna Drive, Fortunestown, Citywest, Co. Dublin. The proposed residential scheme will comprise of 463 no. residential units (89 no. houses, 353 no. apartments, 21 no. duplex apartments), creche and associated site works.

Construction Phase:

Given the considerable distance of approximately 1.73 kilometers between the two developments, combined with the significant sound attenuation provided by existing buildings and infrastructure, it is unlikely that any cumulative noise and vibration effects will be experienced during the short-term construction phase. This assessment holds true even if both projects' construction periods run simultaneously.

Operational Phase:

During the long-term operational phase, the distance and screening between the two developments will continue to provide effective attenuation. Consequently, there will be no cumulative noise and vibration effects on the surrounding area. The quality of this effect is neutral, its significance is imperceptible, and it is considered to be not significant.

SDCC Reg. Ref. LRD22A/0002:

The proposed large-scale residential scheme is located approximately 2 kilometers from the proposed development at "The Foothills", within the townlands of Killinarden and Kiltalown, Tallaght, Co. Dublin. The proposed large-scale residential scheme will comprise of 635 no.

residential units, a creche, community centre, retail/commercial units, public open space and all associated site development works.

Construction Phase:

Given the considerable distance of approximately 2 kilometers between the two developments, combined with the significant sound attenuation provided by existing buildings and infrastructure, it is unlikely that any cumulative noise and vibration effects will be experienced during the short-term construction phase. This assessment holds true even if both projects' construction periods run simultaneously.

Operational Phase:

During the long-term operational phase, the distance and screening between the two developments will continue to provide effective attenuation. Consequently, there will be no cumulative noise and vibration effects on the surrounding area. The quality of this effect is neutral, its significance is imperceptible, and it is considered to be not significant.

ABP- 316828-23

The application for the BusConnects Tallaght/Clondalkin Core Bus Corridor scheme will ensure public transport services can access key areas such as the retail and recreational centre of the city; public transport hubs at the rail and bus station; along with the city centre hotels.

Construction Phase:

The BusConnects Tallaght/Clondalkin Core Bus Corridor scheme has been approved, with construction works expected to be of short duration. Its EIAR, prepared by Arup, concludes that most construction activities will have a negative, not significant to slight, and temporary effect. However, general road works, urban landscaping, and utility diversion works are predicted to have a negative, moderate to significant, and temporary effect on receptors within 15 meters. Given the approval in 2024 and the short-term nature of its construction, it is unlikely that the two projects' construction periods will overlap, thereby avoiding a cumulative noise and vibration effect.

Operational Phase:

Chapter 9 of the BusConnects EIAR concludes that the operational phase will not cause a negative noise effect on the surrounding area during the 2043 design year. This is due to traffic redistribution. As a result, the long-term cumulative noise effect from both developments in operation is also predicted to be not significant on surrounding sensitive receptors.

SDCC Reg. Ref. 319500 LRD23A/0011:

The proposed large-scale residential scheme is located approximately 3.96 kilometers from the proposed development within the townland of Newcastle South, Newcastle and along Athgoe Road and Hazelhatch Road (R405) to Ground Investigations Ireland premises, Newcastle, Co. Dublin. The proposed large-scale residential scheme will comprise of the construction of 119 houses, 12 apartments and all associated site works. An Environmental Impact Assessment Report (EIAR) was submitted with this application.

Construction Phase:

Given the considerable distance of approximately 3.96 kilometers between the two developments, combined with the significant sound attenuation provided by existing buildings and infrastructure, it is unlikely that any cumulative noise and vibration effects will be experienced during the short-term construction phase. This assessment holds true even if both projects' construction periods run simultaneously.

Operational Phase:

During the long-term operational phase, the distance and screening between the two developments will continue to provide effective attenuation. Consequently, there will be no cumulative noise and vibration effects on the surrounding area. The quality of this effect is neutral, its significance is imperceptible, and it is considered to be not significant.

SDCC Reg. Ref. SHD3ABP-306705-20/EP:

The proposed residential scheme is located approximately 4.9 kilometers from the proposed development at the former Gallaher's Cigarette Factory site, at the junction of Airton Road and Greenhills Road, Tallaght, Co. Dublin. The proposed residential scheme will comprise of the demolition of existing factory/warehouse buildings on site (total floor area c. 10,076.8sq.m). Construction of 502 apartments (comprising 197 1-bed; 257 2-bed; and 48 3-bed units) within 6 blocks ranging in height from 4 to 8 storeys. All residential units provided with associated private balconies/terraces to the north/south/east/west elevations. Provision of residential amenity facilities, 3 retail units, creche and services/bin store areas (total non-residential floor area c.1, 839sq.m). A total of 202 car parking spaces (at basement and undercroft levels) and 584 no. bicycle parking spaces. Vehicular/pedestrian/cyclist accesses from Greenhills Road and Airton Road. Provision of road improvements and pedestrian crossings. All associated site development works, open space, landscaping, boundary treatments, plant areas, PV panels (at roof level), waste management areas, and services provision (including ESB substations).

Construction Phase:

Given the considerable distance of approximately 4.9 kilometers between the two developments, combined with the significant sound attenuation provided by existing buildings and infrastructure, it is unlikely that any cumulative noise and vibration effects will be experienced during the short-term construction phase. This assessment holds true even if both projects' construction periods run simultaneously.

Operational Phase:

During the long-term operational phase, the distance and screening between the two developments will continue to provide effective attenuation. Consequently, there will be no cumulative noise and vibration effects on the surrounding area. The quality of this effect is neutral, its significance is imperceptible, and it is considered to be not significant.

10.5.5 “Do Nothing” Impact

Under the Do-Nothing scenario, the prevailing noise environment at the closest noise and vibration sensitive locations will remain in line with those measured during the baseline study and hence will be of neutral effect in terms of noise and vibration effect. Figures outlined in Chapter 14: Material Assets: Traffic, the traffic levels will not increase by more than 25% which

would equate to an increase of 1dB in traffic noise levels. Therefore, there will be no additional noise effect from the operation of vehicles. Table 10-34 outlines the operational traffic and percentage impact on the existing road network detailed in Figure 10-5.

However, the demand for housing and associated infrastructure generated by the existing and projected population would persist. In the absence of development at this centrally located, serviced, and zoned site, this demand may be displaced to less sustainable, peripheral, or unserviced locations. This could result in greater environmental impacts due to increased land take, car dependency, and pressure on less serviced or less accessible infrastructure.

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

Table 10-34 Survey vs Do-Nothing Comparison

Site	AADT (Apr 2025 – Dublin Urban)	AADT (Do Nothing) 2032	% Increase
1	20930	22841	9.13
2	7578	8270	9.13
3	12513	13657	9.14
4	13328	14546	9.14
5	4826	5267	9.14
6	14487	15810	9.13
7	18337	20012	9.13
8	15147	16530	9.13

Table 10-35 outlines the magnitude of change based on the increase in traffic flows from the Do-Nothing (2032) scenario. Traffic levels increasing less than 25% will likely equate to an increase of noise levels in the range of 1dB(A). The additional traffic generated by the proposed development will not lead to a significant increase in noise or contribute to adverse noise impact on surrounding sensitive receptors.

Table 10-35 Magnitude of Change

Noise Change, dB	Magnitude of Impact
0	No Change
0.1 – 2.9	Negligible
3 – 4.9	Minor
5 – 9.9	Moderate

Noise Change, dB	Magnitude of Impact
10+	Major

RECEIVED: 11/12/2025

10.6 Avoidance, Remedial & Mitigation Measures

This section outlines remedial and mitigation measures based on the predicted noise and vibration effects of the construction and operational phases of the Proposed Development.

10.6.1 Construction Phase

10.6.1.1 Noise and Vibration Mitigation Measures

Best practice measures for noise and vibration from construction sites are found within BS 5228 (2009+A1:2014) part 1 and part 2. Construction noise effects are expected to vary during the construction phase of the Proposed Development; this effect will depend on the distance between the construction activities and noise sensitive receptors. The contractor will ensure that all best practice noise control measures will be used, to ensure any negative noise effects at noise sensitive locations are minimised. The mitigation measures outlined in this chapter will be incorporated into the CEMP.

The best practice measures set out in BS 5228 (2009) Part 1 and 2 includes guidance on several aspects of construction site mitigation measures, this includes the:

- Selection of quiet plant and equipment;
- Noise control at source of the noise;
- Screening; and
- Public liaison.

10.6.1.1.1 Selection of Plant and Machinery

The noise effect of all plant and machinery shall be assessed prior to selection of the plant for the project. All plant used onsite will comply with S.I. No. 632/2001 - European Communities (Noise Emission by Equipment For Use Outdoors) Regulations, 2001.

10.6.1.1.2 Noise Control at Source

Where replacing a noisy item of plant is not viable or practical, noise shall be controlled at source. This includes modifying the piece of plant or machinery to generate less noise, using dampening to control vibration induced noise or rattling. Example best practice mitigation measures to be used are as follows:

- All plant and equipment to be switched off when not in use to prevent idling;
- The use of white noise reversing alarms;
- Restriction on the dropping and loading of materials to less sensitive hours;
- The use of local screening for noisy activities or works with hand tools;
- Not dropping materials onto hard surfaces and using rubber mats etc for the dropping of materials; and
- Ensure all plant and equipment is well maintained and cleaned, all lubrication should be in line with manufacturers guidelines.

10.6.1.1.3 Vibration Control

Vibration monitoring will be implemented during the demolition and substructure stages of the construction phase to ensure vibration effects are monitored and controlled adequately as to not cause significant effect at the surrounding sensitive receptors. Suitable locations for vibration monitoring are at NSL1 and NSL4.

10.6.1.1.4 Screening

Screening will be used to reduce the construction noise effect on the NSLs. The use of site hoarding and careful selection of areas for noisy works, using buildings on the site, site offices and the building being constructed to screen noise from the works.

Local screening of noisy works with the use of temporary acoustic barriers, examples are as follows:



Figure 10-10 Temporary Construction Noise Barrier © Ventac

10.6.1.1.5 Public Engagement

A public liaison officer shall be put forward by the contractor to liaise with the local residents on matters relating to noise. Residents shall be informed of any noise works scheduled where there is the potential to generate high levels of construction noise or if specialist works etc need to be conducted out of the working hours. This person shall also be the point of contact for all complaints and be responsible for reviewing the noise monitoring results and exceedances.

This is crucial as the construction of the development is proposed to be a phase construction and occupancy approach with the construction of phase 1A and phase 1B being constructed, with phase 2A and 2B beginning shortly after occupancy of phase 1A and 1B. A public liaison officer shall be appointed by the contractor to liaise with the occupants of phase 1A and 1B regarding matters of noise and vibration disturbance.

10.6.1.1.6 Site Specific Recommendations

The calculations set out in Table 10-9 of Section 10.5.2.1 are based on assumed site construction works and a combination of the plant operating at the same time i.e. a worst-case

scenario. While this may not reflect actual site conditions, the assessment has been carried out on a conservative basis. Table 10-36 - Table 10-41 outlines the required attenuation for each construction stage.

Table 10-36 Attenuation Required at Each Stage Based on the Construction Noise Predictions for Phase 1A.

Location	Noise Limit dB (A)	Noise reduction required at each stage of works to meet criteria (dBA)			
		Site Set Up	Substructure	Superstructure	External Finishes
NSL1	65	0	0	0	0
NSL2	65	0	0	0	0
NSL3	65	0	0	0	0
NSL4	65	0	0	0	0
NSL5	65	0	0	0	0
NSL6	65	0	2	0	0
NSL7	65	0	0	0	0

Table 10-37 Attenuation Required at Each Stage Based on the Construction Noise Predictions for Phase 1B.

Location	Noise Limit dB (A)	Noise reduction required at each stage of works to meet criteria (dBA)			
		Site Set Up	Substructure	Superstructure	External Finishes
NSL1	65	0	0	0	0
NSL2	65	0	0	0	0
NSL3	65	0	0	0	0
NSL4	65	0	2	0	0
NSL5	65	0	0	0	0
NSL6	65	0	2	0	0
NSL7	65	0	0	0	0
Phase 1A	65	0	0	0	0

Table 10-38 Attenuation Required at Each Stage Based on the Construction Noise Predictions for Phase 2A.

Location	Noise Limit dB (A)	Noise reduction required at each stage of works to meet criteria (dBA)			
		Site Set Up	Substructure	Superstructure	External Finishes
NSL1	65	0	0	0	0
NSL2	65	0	0	0	0
NSL3	65	0	0	0	0
NSL4	65	0	0	0	0
NSL5	65	0	0	0	0
NSL6	65	0	0	0	0
NSL7	65	0	0	0	0
Phase 1A	65	0	0	0	0
Phase 1B	65	0	0	0	0

Table 10-39 Attenuation Required at Each Stage Based on the Construction Noise Predictions for Phase 2B.

Location	Noise Limit dB (A)	Noise reduction required at each stage of works to meet criteria (dBA)			
		Site Set Up	Substructure	Superstructure	External Finishes
NSL1	65	0	0	0	0
NSL2	65	0	0	0	0
NSL3	65	0	0	0	0
NSL4	65	0	0	0	0
NSL5	65	0	0	0	0
NSL6	65	0	0	0	0
NSL7	65	0	0	0	0
Phase 1A	65	0	0	0	0
Phase 1B	65	0	0	0	0
Phase 2A	65	0	0	0	0

Table 10-40 Attenuation Required at Each Stage Based on the Construction Noise Predictions for Phase 3A.

Location	Noise Limit dB (A)	Noise reduction required at each stage of works to meet criteria (dBA)			
		Site Set Up	Substructure	Superstructure	External Finishes
NSL1	65	0	4	1	0
NSL2	65	0	0	0	0
NSL3	65	0	0	0	0
NSL4	65	0	0	0	0
NSL5	65	0	0	0	0
NSL6	65	0	0	0	0
NSL7	65	0	0	0	0
Phase 1A	65	0	0	0	0
Phase 1B	65	0	0	0	0
Phase 2A	65	0	0	0	0
Phase 2B	65	0	0	0	0

Table 10-41 Attenuation Required at Each Stage Based on the Construction Noise Predictions for Phase 3B.

Location	Noise Limit dB (A)	Noise reduction required at each stage of works to meet criteria (dBA)			
		Site Set Up	Substructure	Superstructure	External Finishes
NSL1	65	0	3	0	0
NSL2	65	0	0	0	0
NSL3	65	0	0	0	0
NSL4	65	0	0	0	0
NSL5	65	0	0	0	0
NSL6	65	0	2	0	0
NSL7	65	0	0	0	0

Location	Noise Limit dB (A)	Noise reduction required at each stage of works to meet criteria (dBA)			
		Site Set Up	Substructure	Superstructure	External Finishes
Phase 1A	65	0	0	0	0
Phase 1B	65	0	0	0	0
Phase 2A	65	0	0	0	0
Phase 2B	65	0	0	0	0
Phase 3A	65	0	6	3	0

Table 10-42 outlines the recommended site-specific noise mitigation measures.

Table 10-42 Mitigation Measures Required During Construction Phase

Construction Stage	Recommended Noise Mitigation Measures
Site Setup	<p>Erect a minimum 2.4m high site hoarding that blocks the line of sight between noise source and receiver.</p> <p>Example construction for the site hording would be as follows: A 2.4m high and 9mm plywood (4.5 kg/m2). Barrier must be solid and not contain gaps at the bottom or between adjacent panels</p> <p>Local screening are required around hand tools in addition to hoarding.</p> <p>An absorptive lining shall be considered for screening around hand tools will need to have an absorptive lining to avoid reflections increasing noise at other receivers.</p> <p>On this project 8 NSL's have been identified, It is recommended that a noise monitor shall be placed on the boundary of the nearest noise sensitive locations closest to the works i.e. NSL1 and NSL8/NSL9 during phase 2 in this case.</p>
Substructure	<p>Site hoarding to block line of sight. Local screening around noisy plant and equipment.</p> <p>Noise and vibration monitoring as above</p>
Superstructure	<p>Local screening around saws/hammers where possible. Use external new building to screen noise from works where possible.</p> <p>Noise and vibration monitoring as above</p>
External finishes	<p>Local screening around hand tools.</p> <p>Noise and vibration monitoring as above</p>

10.6.2 Operational Phase

10.6.2.1 Noise Mitigation Measures

The assessment conducted on the operational phase of the Proposed Development takes into account the operation of the public and communal open spaces, car parking and creche outdoor play area. The predicted results of the operational noise assessment predict that there will be no significant noise effect on the surrounding sensitive receptors, therefore no mitigation measures are required to control operational noise levels from the proposed development.

At design development stage, when the final plant and equipment schedule developed, noise levels for each piece of equipment shall be reviewed by an Acoustic Consultant to ensure compliance with the limits set in this chapter and to protect the amenity of the future residents of the Proposed Development.

10.6.2.2 Vibration Mitigation Recommendations

There are no predicted vibration sources during the operational phase, therefore, mitigation measures are not required to control operational phase vibrations. This shall be reviewed as part of the design review once the final plant and equipment selections are known.

10.6.3 Operational Phase – Inward Impact

10.6.3.1 Building Envelope Specification

This section outlines the building envelope requirements based on the measurements outlined in Section 10.3.2. Facade, wall, glazing, roof and ventilation specifications have been determined to achieve the internal noise level criteria for the development. The specification has been determined in accordance with EN ISO 12354-3: 2017 based on the predicted façade day and night noise levels. The specification outlined in this section is based on the measured noise levels at the site and has taken into consideration aircraft noise. Consideration has also been given to the internal roads within the site.

The building envelope specification should be confirmed by the acoustic consultant at design stage once the internal layouts and design development has been completed. Any changes to the assumed ventilation strategy and glazing requirement should be considered as part of the review and it should be based on the internal noise levels cited in this report.

The glazed elements and ventilation openings are typically the acoustically weakest elements of any façade. The required sound insulation performance of façade glazed elements and ventilation openings is outlined in Table 10-43.

It is required that the glazing, frame and seals as a whole achieve the performance when the window is in the closed position. The performance requirements outlined in Table 10-43 are considered to provide adequate sound insulation to achieve the relevant day and night internal design goals respectively.

Table 10-43 Sound Insulation Performance for Glazed Elements and Ventilation

Façade	Glazed Elements (Frame & Glazing) Sound Insulation Requirements (indicative requirements equal or approved)							Glazing Acoustic Performance dB RW	Façade Ventilation Requirement ²
	Octave Band Frequency Requirements ¹ R dB								
	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz			
RED	28	20	28	35	40	42	32dB Rw	35dB D _{n,e,w} (1) Natural Ventilation or Mechanical Ventilation	
All other Façade	Standard Double Glazing ³							Standard passive ventilation	

- 1) Natural ventilation assumed throughout. Should this change to mechanical ventilation the above specification may be reduced. An acoustic consultant should be engaged to assess the level of reduction appropriate to maintain the internal noise level criteria.
- 2) The calculation assumes a maximum of 1 ventilation opening per bedroom at the specification outlined in the Acoustic Design Statement.
- 3) Standard double glazing assumes a construction of two panes of 3mm glass with a 10mm cavity achieving a minimum 29dB R_w, equal or approved. Similarly, standard natural ventilation assumes a performance of 29dB D_{n,e,w}.



Figure 10-11 Façade Specification Markup Detailing the Glazing Specification

It is important to note that the requirements outlined above are minimum requirements for the glazed element as a whole. The octave band values are indicative and specific to the assessed glazing type, equal or approved to meet the minimum project requirements is acceptable.

We understand the ventilation strategy for the development has not been confirmed at this stage of the design. It has been assumed that ventilation will be provided via natural ventilation system. Should the ventilation strategy change to mechanical ventilation strategy Wave Dynamics should be notified. Typically, the use of a natural ventilation strategy will lead to an enhanced glazing specification compared to a sealed mechanical ventilation system. This assessment is based on the windows in closed position.

10.6.3.1.1 External Wall Construction

The façade wall construction has been assumed to achieve a minimum sound insulation performance of 56dB R_w . Typical façade construction such as concrete, blockwork, timber frame and brick offer high levels of sound insulation and will meet this requirement.

10.6.3.1.2 Roof Construction

The roof construction has been assumed to achieve a minimum sound insulation performance of 50dB R_w . Any skylights and glazing in the roof system to corridor or communal areas should be of standard double-glazed construction to meet a performance of minimum 29 dB R_w . If there are any skylights to habitable bedrooms Wave Dynamics should be informed to provide specific guidance in each case.

10.6.3.1.3 External Amenity Space

Measured daytime noise levels across the Proposed Development lands were generally found to be below the external amenity criterion of 55 dB(A) as outlined in ProPG:2017, indicating that the existing acoustic environment is compliant with external amenity criterion. While marginally elevated levels were recorded at location L1 closest to existing road infrastructure, these values reduce significantly with distance into the site. As the development is constructed, the introduction of new buildings will provide substantial screening from surrounding noise sources. Consequently, external amenity spaces located deeper within the site are expected to experience further reductions in noise levels, benefiting from screening effects and resulting in an improved overall acoustic environment for future occupants.

10.6.4 “Worst Case” Scenario

This assessment assumes a worst-case scenario when assessing the construction and operational noise and vibration effects on the surrounding noise sensitive locations. The dominating noise source in the area is road traffic noise and intermittent aircraft noise which has been assessed, the additional construction traffic is not predicted to generate any additional noise effect. The operational traffic flows outlined in Section 10.5.3.3.8 are not predicted to cause an increase in traffic noise levels at the surrounding sensitive receptors. Additional operational noise sources such as plant and equipment, creche outdoor play area, public and communal open spaces all contribute to the operational noise emissions of the Proposed Development, as outlined in Section 10.5.3 the predicted noise emissions of the Proposed Development are within the project criteria.

10.7 Residual Effects

This section outlines the potential significant environment effects which remain after mitigation measures are implemented.

10.7.1 Construction Phase

10.7.1.1 Noise

As the construction phase is temporary, there will be no long-term/permanent noise effects on the surrounding area from construction noise. Section 10.6.1 outlines mitigation measures which will reduce the construction noise effect on the surrounding sensitive receptors and result in an overall effect that is considered non-significant in EIA terms.

10.7.1.2 Vibration

As the construction phase is temporary, there will be no long term/permanent vibration effects on the surrounding area from construction activities. Section 10.6.1 outlines mitigation measures which will reduce the construction vibration effect on the surrounding sensitive receptors and result in an overall effect that is considered non-significant in EIA terms.

10.7.2 Operational Phase

10.7.2.1 Noise

Operational noise sources from the Proposed Development include the public and communal open spaces, crèche outdoor play area, and on-site traffic from car parking.

Based on the operational noise assessment, the predicted noise levels from all sources will not cause adverse noise effects on the surrounding sensitive receptors. These effects are considered to be neutral in quality and slight in significance. They are permanent and continuous, and their occurrence is likely. However, when applying the binary conclusion framework as per EPA guidance, these effects are determined to be not significant in EIA terms.

10.7.2.2 Vibration

Based on the type, and assumed usage of the development, it is not expected that there will be any operational vibration effects on surrounding noise sensitive receptors. As such, operational vibration effects on surrounding sensitive receptors are considered non-significant in EIA terms.

10.7.3 Cumulative Residual Effects

10.7.4 Construction Phase

10.7.4.1 Noise

The cumulative construction noise effects of the proposed development in conjunction with other projects are considered not significant, provided the recommended mitigation measures are fully implemented. While a worst-case scenario of simultaneous construction could lead to potential adverse effects, this is considered unlikely due to the varying timelines and distances of the other developments. The staggered construction phases of the proposed development and the distance from the other proposed residential developments and BusConnects projects (approximately between 240 meters to 4.9 kilometers from the site) are expected to minimise cumulative effects.

10.7.4.2 Vibration

The cumulative construction vibration effects of the proposed development are also deemed not significant. While construction activities from the proposed development and other nearby projects (such as the proposed LRD's) could potentially overlap, the considerable distances between sites (e.g., the LRD being 3.96 kilometers away) provide significant natural attenuation. Furthermore, the most intensive vibration-producing activities, like piling and demolition, are typically of a short duration. The full implementation of the mitigation measures in this chapter will ensure that any combined vibration effects are minimized, leading to a conclusion of not significant residual cumulative effects.

10.7.5 Operational Phase

10.7.5.1 Noise

The cumulative residual effect of operational noise from the proposed development and other concurrent projects is concluded to be not significant. This is based on a comprehensive assessment of various noise sources and their combined long-term impact. The operational noise from the proposed development's on-site sources such as the crèche, public and communal open spaces assessed as having an imperceptible effect on surrounding sensitive receptors. When these are combined with the operational noise from other developments like large residential schemes, smaller residential schemes and BusConnects, the cumulative effect remains not significant. The minimal changes in road traffic noise from each development and the substantial distances and screening between them ensure that the combined long-term noise effects on the surrounding area are negligible.

10.7.5.2 Vibration

The operational phase of the proposed development is not expected to generate any perceptible vibration, nor are the other concurrent projects in the area. Therefore, the cumulative residual vibration effects during the long-term operational phase are assessed as not significant. There will be no adverse vibration conditions on the surrounding area from the combined operation of these developments.

10.7.6 Summary of Post-Mitigation Effects

This section outlines the summary of post-mitigation effects of the Proposed Development on the surrounding sensitive receptors.

10.7.6.1 Construction Phase

Following the application of mitigation measures, the likely significant residual effects during the construction phase are summarized in Table 10-44. The quality of effects is neutral for both noise and vibration. The significance of noise is assessed as slight, but based on the binary conclusion framework, it is ultimately determined to be not significant. The vibration effects are assessed as imperceptible, also resulting in a binary conclusion of not significant. Both of these effects are considered short-term.

Table 10-44 Summary of Construction Phase Effects Post Mitigation

Quality	Significance	Duration	Type
Neutral	Slight	Short-Term	Noise
Neutral	Imperceptible	Short-Term	Vibration

10.7.6.2 Operational Phase

Based on the noise impact assessment, the Proposed Development does not require mitigation measures to reduce the effect on the surrounding sensitive receptors, however, the likely significant residual effects during the operational phase are summarized in Table 10-45. The quality of effects is neutral for noise and the significance of noise is assessed as slight. The quality of effects is neutral for vibration and the significance of vibration effects are assessed as imperceptible. Both of these effects are considered long-term.

Table 10-45 Summary of Operational Phase Effects Post Mitigation

Quality	Significance	Duration	Type
Neutral	Slight	Long-Term	Noise
Neutral	Imperceptible	Long-Term	Vibration

10.8 Monitoring

This section outlines the recommended noise and vibration monitoring during the construction and operational phase of the Proposed Development.

10.8.1 Construction Phase

Noise and vibration monitoring will be implemented during the construction phase of the Proposed Development, particularly during the substructure works when piling operations are likely to occur. Given the proximity of multiple NSLs to the site, monitoring equipment shall be installed at NSL 4 during phase 1A/B and NSL3 during phase 2A/B and NSL1 during phase 3A/B, as these locations are closest to the anticipated construction activities.

10.8.2 Operational Phase

Noise and vibration monitoring is not required during the operational phase of the Proposed Development as the predicted noise levels during the operational phase fall within project criteria, and there are no predicted sources of operational vibration proposed for the development.

10.9 Interactions

This chapter has the potential to interact with the following environmental topics:

- Population and Human Health (Chapter 4);
- Material Assets: Traffic (Chapter 12).

10.9.1 Population and Human Health

In this EIAR, the Noise and Vibration chapter has been developed in close coordination with the Population and Human Health chapter to assess the potential effects of noise on NSLs. The location of NSLs informed the selection of assessment locations for noise modelling. Predicted noise levels from both the construction and operational phases have been evaluated in terms of their potential effects on human health, including annoyance and disturbance. The integrated approach ensures that the assessment considers, not only technical compliance with noise limits, but also the broader implications for community wellbeing.

10.9.2 Material Assets: Traffic

This chapter incorporates data from the traffic consultants to assess the potential noise effects from both construction and operational traffic associated with the Proposed Development. Annual Average Daily Traffic (AADT), vehicle speed and vehicle types (including HGVs) have been considered to calculate the additional noise generated by the Proposed Development, relative to the baseline conditions. Based on the predicted increase in traffic volumes and traffic levels increasing less than 25%, this will likely equate to an increase of noise levels in the range of 1dB(A). This increase is considered negligible, as the lowest decibel change the human ear can discern is 3dB making this increase negligible in terms of magnitude of change.

10.10 Difficulties Encountered When Compiling

There were no difficulties when compiling this chapter.

10.11 Conclusion

This chapter provides a comprehensive assessment of the potential noise and vibration effects associated with the Proposed Development. It examines both the construction and operational phases, analyses the impacts on human receptors and outlines the necessary mitigation measures to ensure that the project complies with all relevant noise and vibration criteria. The methodology is based on established best-practice guidance from sources such as BS 5228 and the EPA's NG4.

10.11.1 Construction Phase

10.11.1.1 Noise

Based on the unmitigated noise assessment, the construction phase is expected to have a significant, temporary effect on surrounding Noise Sensitive Locations (NSLs). Without mitigation, the predicted noise levels from on-site activities, such as substructure works, are likely to exceed the project criteria of 65 dB(A) $L_{Aeq,T}$ at all NSLs.

- **Quality of Effect:** Neutral
- **Significance:** Significant
- **Duration:** Temporary
- **Probability:** Likely

However, with the implementation of the mitigation measures outlined in Section 10.6, these effects will be properly managed and reduced to acceptable levels. The assessment of

construction traffic noise concludes that the projected increase in vehicle numbers is negligible and will not cause a perceptible or significant increase in noise levels.

10.11.1.2 *Vibration*

The potential for unmitigated construction vibration is also assessed. While vibration is not anticipated to be a major concern for the majority of the construction period, it is a possibility during the substructure phases due to activities like piling. The effect is determined to be slight in significance, which, according to the binary judgment framework, means it is not significant. This is a temporary effect that is likely to occur. The lack of a major vibration effect is further supported by the sequencing of works, where demolition is completed before the main construction phase begins.

- **Quality of Effect:** Neutral
- **Significance:** Not Significant (Slight)
- **Duration:** Temporary
- **Probability:** Likely

10.11.2 *Operational Phase*

10.11.2.1 *Noise*

The assessment of operational noise sources, including the crèche outdoor play area, and public and communal open spaces, concludes that the overall effect on external sensitive receptors will be not significant. The quality of effect is neutral, and the significance is considered slight, with a likely and permanent occurrence.

- **Quality of Effect:** Neutral
- **Significance:** Not Significant (Slight)
- **Duration:** Long-Term
- **Probability:** Likely

The performance specification for the building envelope has been provided in this report which includes the external walls, glazing, roof and ventilation requirements.

10.11.2.2 *Vibration*

The operational phase of the proposed development is not expected to generate any perceptible vibration. As there are no anticipated sources of significant vibration, the effect is concluded to be neutral in quality and imperceptible in significance. This is a permanent effect, yet its probability of occurrence is unlikely. Therefore, the operational vibration effect on surrounding NSLs will be not significant.

- **Quality of Effect:** Neutral
- **Significance:** Imperceptible
- **Duration:** Long-Term
- **Probability:** Unlikely

10.11.3 Overall Conclusion

The comprehensive noise and vibration assessment concludes that the proposed development's unmitigated construction activities will have a significant adverse effect on surrounding sensitive receptors. However, these impacts are temporary and can be effectively mitigated through the measures detailed in this chapter, reducing the final effect to a not significant level. During the operational phase, the development is not expected to cause any adverse noise or vibration effects on external receptors. The performance specification for the building envelope has been provided in this report which includes the external walls, glazing, roof and ventilation requirements and has taken into consideration road noise, aircraft noise and the internal road within the development. The final residual effect of the proposed development will therefore be not significant with the successful implementation of all mitigation and design measures.

10.12 References

Design Manual for Roads and Bridges Volume 11 Section 3 Part 7 (HD 213/11 – Revision 1) (The Highways Agency et al., 2011);

BS 8233:2014 Guidance on sound insulation and noise reduction for buildings;

BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise;

BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Vibration;

BS 7385: 1993: Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration;

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

ISO 1996-2:2017 Acoustics - Description, measurement and assessment of environmental noise Part 2: Determination of sound pressure levels;

ISO 9613-1:1993 Acoustics - Attenuation of sound during propagation outdoors -- Part 1: Calculation of the absorption of sound by the atmosphere;

ISO 9613-2:1996 Acoustics - Attenuation of sound during propagation outdoors -- Part 2: General method of calculation;

British Standard BS 6472-1:2008 Guide to evaluation of human exposure to vibration in buildings;

Environmental Protection Agency (2016) Guidance Note for Noise (NG4): Licence Applications, Surveys and Assessments in Relation to Scheduled Activities;

BS 4142:2014+A1:2019: Methods for rating and assessing industrial and commercial sound;

Guidelines for the Treatment of Noise & Vibration in National Road Schemes, National Roads Authority, Revision 1, 25th October 2004;

ProPG 2017 Professional Practice Guidance on Planning & Noise;

AAAC: Licensed Premises Noise Assessment Technical Guideline;

NRA Traffic Grid Flow Pattern;

ISO 9613-2: 1996 (Parkplatzlarmstudio 2007);

Calculation of Road Traffic Noise (CoRTN): 1998;

S.I. No. 549/2018 – European Communities (Environmental Noise) Regulations 2018
(hereafter referred to as the Noise Regulations);

S.I. No. 241/2006 - European Communities Noise Emission by Equipment for Use Outdoors
(Amendment) Regulations 2006;

WHO Environmental Noise Guidelines (2019).

South Dublin County Council County Development Plan, 2022-2028.

Dublin Agglomeration Noise Action Plan 2024-2028

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