12 AIR (NOISE AND VIBRATION)

12.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) provides a detailed evaluation of the potential impacts arising from noise and vibration associated with the construction and operational phases of the proposed development. The assessment has been carried out in accordance with relevant national and international guidance documents and best practice standards.

The chapter begins with a description of the existing acoustic environment, established through baseline noise monitoring undertaken at selected locations representative of nearby noise-sensitive receptors. This baseline data forms the foundation for assessing the significance of any changes in noise and vibration levels resulting from the proposed development.

The potential impacts of both construction activities (including site preparation, earthworks, and building operations) and operational activities (such as increased traffic flows, plant and equipment operation, or other relevant sources) are examined in relation to the identified baseline conditions.

Where potential adverse impacts are identified, appropriate mitigation measures are proposed to minimise or eliminate such effects, in line with the principles of good acoustic design and planning policy guidance. The residual impacts, taking into account the effectiveness of these measures, are then assessed.

This chapter aims to ensure that noise and vibration considerations are fully integrated into the planning and design process, and that the proposed development can proceed without giving rise to significant or unacceptable effects on the surrounding environment or sensitive receptors.

12.2 Assessment Methodology

This chapter of the EIAR has been prepared by Wave Dynamics Limited an Acoustic Consultancy specialising in noise and vibration. The EIAR chapter was prepared by Shannon Doherty | Senior Acoustic Consultant, Shannon has over 12 years' experience in building acoustics and environmental noise and has experience in numerous similar planning stage EIAR assessments. Shannon's qualifications include; BSc (Hons) in Music Technology, IOA Diploma in Acoustics and Noise Control. He is a member of the Institute of Acoustics.

This report was peer reviewed by James Cousins, Managing Director | Principal Consultant with Wave Dynamics who has extensive experience in assessing noise and vibration from road and rail infrastructure on commercial and residential developments. James is an experienced consultant. His qualifications include; 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.

12.3 Assessment Methodology

This assessment will examine the likely impacts of sound pressure levels generated by the proposed development located at Kellystown, Dublin 15. Noise calculations have been used to predict and assess the likely impact of the new development on the existing noise sensitive receptors. This section addresses the potential noise and vibration impact from the proposed Plot 1 (Luttrellstown Gate Phase 2) and Plot 2 (St. Mochta's LRD)developments at Kellystown, Dublin 15.

For the purpose of the assessment 'sensitive receptors' terminology used describes any persons, locations or otherwise that may be susceptible to changes as a consequence of the proposed development. The primary noise impacts associated with the proposed development are likely to be due to:

- Site clearance works;
- Building construction works;

- Vehicles entering and exiting the site; and,
- Traffic along local road network.

The assessment of the noise and vibration impacts 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 the operational and construction elements of the project, the inward noise impact has been considered as part of this chapter given the proximity of the development to the Dublin rail line.

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;
- BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise;
- 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.
- Institute of Acoustics, Chartered Institute of Environmental Health, & Association of Noise Consultants. (2017). *ProPG: Planning & noise – New residential development*.
- Environmental Protection Agency (2016) Guidance Note for Noise (NG4): Licence Applications, Surveys and Assessments in Relation to Scheduled Activities;
- Guidelines for the Treatment of Noise & Vibration in National Road Schemes, National Roads Authority, Revision 1, 25th October 2004; and
- 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 in the vicinity of the subject 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 during the construction phase of the project at the nearest sensitive locations to the development site.
- Predictive modelling using statistical calculations have been performed to assess the potential impacts associated with the operational of the development at the most sensitive locations surrounding the development site;
- Inward noise impact has been considered to protect the residents of the development and;
- Mitigation measures have been proposed to reduce, where necessary, the identified potential outward impacts relating to noise and vibration from the proposed development.

12.3.1 Assessment Criteria

12.3.1.1 Construction Phase – Noise

Dublin Agglomeration have not outlined specific construction noise limits within the Noise Action Plan, therefore noise limits outlined in BS5228-1:2009+A1 have been adopted as the criteria for this project. BS5228-1 takes into consideration the impact of the ambient noise at the noise sensitive receptor as follows:

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

Table 12-1**:** BS5228 threshold levels.

Note 1: Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are less than these values.

Note 2: Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are the same as category A values.

Note 3: Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are higher than category B values.

Note 4: 19:00 – 23:00 weekdays, 13:00 – 23:00 Saturdays and 07:00 – 23:00 Sunday.

12.3.1.2 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 values (in terms of peak particle velocity) at the closest part of sensitive property to the source of vibration are outlined in Table 12-2 below.

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 4Hz**	**15 to 40Hz**	**40Hz and above**
Light framed structures/ residential buildings	15 mm/s	20 mm/s	50 mm/s

Table 12-2: BS 5228:2009 + A1 2014 Allowable Vibration Values

12.3.1.3 Operational Phase – Noise

12.3.1.3.1 Dublin Agglomeration Noise Action Plan 2024 - 2028

The Dublin Agglomeration Noise Action Plan 2024 – 2028, does not included any specific noise limits with regard to operational noise of commercial premises. Guidance has been sought from other applicable standards for such noise limits, EPA NG4 Guidance note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities has been adopted and used throughout the assessment.

12.3.1.3.2 BS 4142:2014: Methods for Rating and Assessing Industrial and Commercial Sound.

BS4142 describes a method for the assessment of commercial, industrial and background noise to quantify its impact on persons outside of a residential dwelling. BS 4142 has become the de facto standard for compliance investigation. In addition to the specified broadband noise levels the standards provide objective and subjective methods for the assessment of the impulsivity and tonality of the noise sources. This allows for a penalty/ correction to be applied to the measured noise level of the source (L_{Aeq}) to give the rating level ($L_{Ar,T}$).

It considers the likelihood of complaints by considering the margin by which the noise in source the background noise level.

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.

12.3.1.3.3 Internal Receivers within the Development

To protect the amenity of the future residents of the development criteria for the assessment of inward noise impact have been developed.

12.3.1.3.4 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 impact on humans. Its adoption is considered best practice for assessing the potential noise impact 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 12- illustrates the ProPG approach.

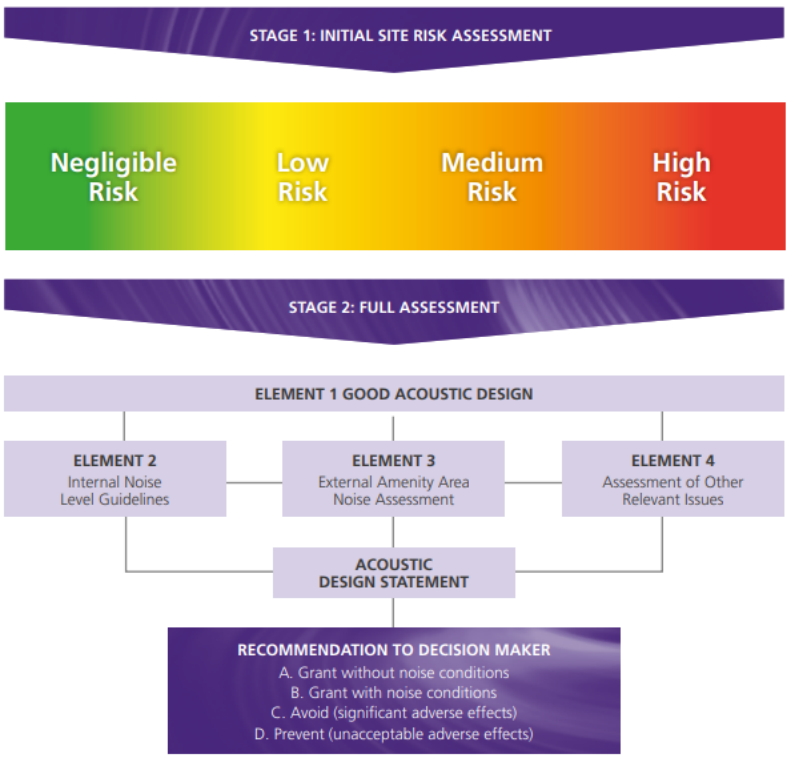

Figure 12-1: Summary of overall ProPG approach

12.3.1.3.5 Internal Noise Levels

Table 12-3 below outlines the recommended 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.

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	35 dB LAeq, 16 hour	-
Sleeping (daytime resting)	Bedroom	35 dB LAeq, 16 hour	30 dB LAeq, 8 hour 45dB LAFmax[1]

Table 12-3: BS 8233:2014 internal noise criteria –Residential Buildings

12.3.1.3.6 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 impacts are still above the recommended noise levels they can be offset by providing an alternative amenity space to partially offset the noise impact 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, publically 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."*

[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

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.

12.3.1.4 Operational Phase – Vibration

12.3.1.4.1 BS5228-2:2009+A1:2014 Cod of Practice for Noise and Vibration Control on Construction and Open Sites.

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 12- below outlines the range of vibration values and the associated potential effects on humans.

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

Table 12-4: Project vibration criteria.

Vibrations typically become perceptible between 0.15mm/s to 0.3mm/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 2.5mm/s if adequate public relations are in place and timeframes are known.

12.4 Receiving Environment

12.4.1 Baseline Environment

12.4.1.1 A baseline noise survey was conducted at the site located at Kellystown, Dublin 15. The purpose of the survey was to quantify the existing noise environment to predict its impact on the surrounding area.

12.4.1.2 The baseline noise survey consisted of both attended and unattended noise measurements and was conducted across the development site from 26th February 2025 to 5th March 2025.

12.4.1.2.1 Site Description and Measurement Locations

The Proposed Development site is located in Kellystown, Clonsilla, Dublin 15. It forms part of the Kellystown Development Masterplan which includes an important residential area with some 1,900 no. residential units, a primary school for c. 600 no. pupils, a secondary school for c. 1,000 no. pupils and a local centre of 2,500sqm.

Kellystown is located approximately 1.5 km south-west of Blanchardstown Town Centre, 1.8 km south-west of Blanchardstown Main Street and 9.8 km north-west from O'Connell Street, Dublin.

The noise measurement locations are illustrated in Figure 12- below and consist of the following;

- Unattended Noise Monitoring at L1;
- Attended Noise Monitoring at A1 – A3; and
- Attended Sound Exposure Level Measurement at SELs of both Aircraft and Trains.

Figure 12-2: Indicative core residential site location and measurement locations L1, A1 – A3 and SEL's.

12.4.1.2.2 Survey Methodology and Personnel

The attended and unattended noise survey was completed by Daniel Cousins (Field Engineer) between the 26th February 2025 to 4th March 2025.

12.4.1.3 Unattended Noise Measurements

An unattended noise logger was deployed in location L1. The monitor was deployed on the 26th of February 2025 at 14:05hrs and collected on 4th of March 2025 at 12:22hrs. The logger was positioned approximately 3m above the ground. 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 12-3: Unattended measurement setup.

12.4.1.4 Attended Measurements

Attended 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 minutes in the locations A1 - A3 as noted in 12-. 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. 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.

Figure 12-3: Attended measurement setup

12.4.1.5 Survey Period

The unattended noise measurements were undertaken between the 26th February 2025 to 4th March 2025.

The attended noise measurements were obtained on the 13th September 2024 and the 5th March 2025.

12.4.1.6 Noise Measurement Equipment

A Class 1 sound level meter/noise logger in general accordance with IEC 61672-1:2013 was used for both the attended and unattended noise measurements. 12.4 below summarises the measurement equipment used.

Description	WD Asset Number	Model	Serial No.	Calibration Certificate No.	Calibration Due Date
Sound Level Meter	SLM1	Nor 140	1405554	U45343/U45344/U45342	27/07/2025
Sound Level Meter	SLM2	NOR140	1406532	SLM230218	27/09/2025
Sound Level Meter	SLM8	Nor 140	1403345	U44270/U44269	16/05/2025
Calibrator	CAL3	Nor 1251	32096	AC240251	03/07/2025

Calibrator	CAL5	Nor 1251	33491	U48214	28/06/2025

Table 12-5: Noise measurement equipment.

12.4.1.7 Subjective Noise Environment

During the attended noise survey, the following noise sources were identified: Bird song, trains passing intermittently, road traffic noise (RTN) and wind blowing on foliage.

12.4.1.8 Noise Measurement Results

Attended and unattended measurements were taken to measure the noise levels across the site. This section outlines the results of the attended noise measurements.

12.4.1.8.1 Attended Measurement Results

Table 12- below outlines the results of the attended measurement survey.

Measurement				Measured Noise Levels		
Location	**Date**	**Time (hrs)**	**Duration (mins)**	**L_{Aeq} dB**	**L_{AFmax} dB**	**L_{A90} dB**
A1	13/09/2024	07:37	15:00	53	60	50
A1	13/09/2024	08:05	15:00	62	72	52
L1	26/02/2025	13:48	15:00	64	73	59
A2	05/03/2025	06:11	15:00	55	73	48
A2	05/03/2025	06:26	15:00	56	73	48
A3	05/03/2025	06:27	15:00	51	64	46
A2	05/03/2025	06:41	15:00	53	74	48
A3	05/03/2025	06:44	15:00	49	65	46
A2	05/03/2025	06:56	15:00	51	69	48
A2	05/03/2025	07:11	15:00	53	69	48
A2	05/03/2025	07:26	15:00	52	74	49
A3	05/03/2025	09:04	60:00	50	70	45

Table 12-6: Attended Noise Measurement Results

12.4.1.8.2 Sound Exposure Levels (SEL)

This section outlines the instances where aircraft and trains were recorded passing north of the proposed development site.

Aircraft Noise

Table 12-7 below outlines the measured sound exposure levels for aircraft passing overhead at the proposed development site.

Aircraft Model	Date	Location	Time (hrs)	Duration (Seconds)	L_{Aeq} dB	L_{AFmax} dB	SEL dB
Plane B737- Max 8AS	13/09/2024	SEL 1	08:57	00:19	56	66	52
Plane B737-8AS	13/09/2024	SEL 1	08:59	00:30	58	63	55

Table 12-7: Aircraft SEL Results

Railway Noise

Table 12- below outlines the measured sound exposure levels for a train passing on the Dublin-Maynooth rail line.

Train Movement/Direction	Date	Location	Time (hrs)	Duration (Seconds)	L_{Aeq} dB	L_{AFmax} dB	SEL dB
West to East	05/03/2025	SEL 2	07:46	00:18	68	77	53
East to West	05/03/2025	SEL 2	07:50	00:23	60	66	53
West to East	05/03/2025	SEL 2	07:53	00:12	63	71	54
East to West	05/03/2025	SEL 2	07:54	00:11	63	66	60
West to East	05/03/2025	SEL 2	09:02	00:11	63	68	55
West to East	05/03/2025	SEL 2	08:14	00:16	66	73	57
East to West	05/03/2025	SEL 2	08:14	00:07	59	66	54

Table 12-8: Train SEL Results

12.4.1.8.3 Unattended Monitoring Results

Table 12- 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 Appendix 12.A.

Start Date	$L_{Aeq,16hour}$ (07:00 – 23:00) dB	L_{night} ($L_{Aeq,8hour}$ 23:00 – 07:00) dB	L_{den} (00:00 – 00:00) dB	10th highest night-time L_{AFmax} dB	L_{AF90} (23:00 – 07:00) dB
26/02/2025	62	58	66	71	42
27/02/2025	63	58	66	70	40
28/02/2025	63	56	66	70	40
01/03/2025	62	56	65	70	38
02/03/2025	62	57	64	71	40
03/03/2025	62	57	65	70	40
04/03/2025	63	N/A	66	N/A	N/A

Table 12-9: Unattended Noise Measurement Results

12.4.1.8.4 Discussion of Measurement Results

The baseline noise monitoring survey consists of both weekday and weekend noise data. Measurements were obtained at various locations throughout the proposed development site to establish the existing noise conditions within the boundary of the site. The ambient noise consisted of traffic noise from local roads in the surrounding area as well as aircraft and railway noise.

12.4.1.8.5 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.

12.4.2 Existing Noise Sources

12.4.2.1 Railway Noise

The existing rail line to the North of the proposed development site is used for transit between Dublin Connolly / Docklands - M3 Parkway - Longford. There are currently a total of approx. 104 scheduled commuter trains using the line on a weekday, 54 inbound and 50 outbound mostly concentrated around the morning/evening peak commuting hours based on information from the Irish Rail website. There are currently a total of 5 passes scheduled for the weekday nighttime period.

On Saturdays there are approx. 57 scheduled commuter trains using the line, 25 inbound and 32 outbound, with a total of 2 passes scheduled for the nighttime period.

On Sundays there are approx. 48 scheduled commuter trains using the line, 24 inbound and 24 outbound, with a total of 1 scheduled train pass for the nighttime period.

We understand that Irish Rail are currently engaging in planning for a new expansion project Dart+ West which will increase the frequency of transit services between Dublin and M3 parkway stations. The Dart+ West project also plans to electrify the majority of the fleet which services these stations. Based on our experience of previous similar developments, the use of the dart will lead to lower onset noise levels over commuter and intercity type trains.

Based on the information obtained from Irish Rail Public Consultation the number of proposed trains that will transit the rail line adjacent to the proposed development site is not currently available. An allowance of up to 100% increase in train passes has been allowed for in the assessment which is a worst case prediction.

12.4.2.2 Aircraft Noise

The development currently resides just inside the Dublin Airport Noise Zone C:

- Zone C – ≥ 54 dB LAeq,16hr and < 63 dB LAeq,16hr and ≥ 48dB L_{night} and < 55 dB L_{night}.

Noise contour maps presented in the most recently submitted EIAR supplement by DAA provided to ABP place the development outside the lowest predicted noise contour of 51 dB LAeq,16hr for the 2025 year scenario. This indicates that the development is outside the lowest predicted contour of 51 – 53dB $L_{Aeq,16hour}$ from aircraft noise and therefore can be considered as low risk.

The proposed development is at greater risk of nighttime aircraft noise due to the current nighttime take off procedure.

Noise contour maps presented in the most recently submitted EIAR supplement by DAA provided to ABP place the development within the 40 – 44dB L_{night} noise contour for the 2025 year scenario.

This shows that the development can be considered as low risk also for nighttime aircraft noise.

12.5 Characteristics of the Proposed Development

The site is situated in Kellystown, Clonsilla, south of the Royal Canal and the Dublin-Maynooth railway line and west of Diswellstown Road. The proposed development is split into 2 plots;

- Proposed Development– Plot 1 (Luttrellstown Gate Phase 2);and
- Proposed Development- Plot 2 (St. Mochta's LRD)

12.5.1 Proposed Development– Plot 1 (Luttrellstown Gate Phase 2)

The Proposed Development– Plot 1 (Luttrellstown Gate Phase 2) is located in Kellystown, Clonsilla, Dublin 15. It forms part of the Kellystown Development Masterplan which includes an important residential area with some 1,900 no. residential units, a primary school for c. 600 no. pupils, a secondary school for c. 1,000 no. pupils and a local centre of 2,500sqm.

Kellystown is located approximately 1.5 km south-west of Blanchardstown Town Centre, 1.8 km south-west of Blanchardstown Main Street and 9.8 km north-west from O'Connell Street, Dublin.

The subject site is bounded to the east and south by the under construction Kellystown development -Phase1- (Planning Application Reg. Ref. No. SHDW/004/21), to the west by the potential future Central Development Area of the Kellystown Local Area Plan, and to the north by railway infrastructure.

The proposed development Plot 1 comprises of 99no. residential units in a mix of houses and duplex units consisting of 71no. 2 storey houses (66no. 3-bedroom and 5no. 4-bedroom), 16no. 3 storey houses (16no. 4-bedroom), 4no. 1-bedroom duplex units and 8no. 2-bedroom duplex units and all associated and ancillary site development and infrastructural works, hard and soft landscaping and boundary treatment works, including public open space; public lighting; surface car parking spaces; bicycle parking spaces/stores for mid-terrace units; bin stores. The proposed development includes a minor amendment to development permi2ed under Reg. Ref. ABP-312318-21,as amended by Reg. Ref. LRD0034-S3, with minor adjustment proposed to the permitted surface water attenuation pond. Vehicular access to the proposed development is provided by the road network permitted under Reg. Ref. ABP-312318-21, as amended by Reg. Ref. LRD0034-S3.

12.5.1.1 Construction Stage

The noise and vibration effects have been considered for both the construction and operational phases of the scheme. During the construction stage of the scheme there will be various sources of noise and vibration from mobile plant and construction activities.

12.5.1.2 Operational Stage

The primary sources during the operational phase will be long term and include additional traffic, plant/equipment and noise from communal spaces.

12.5.2 Proposed Development- Plot 2 (St. Mochta's LRD)

The Proposed Development- Plot 2 (St. Mochta's LRD) is located in Kellystown, Clonsilla, Dublin 15. It forms part of the Kellystown Development Masterplan which includes an important residential area with some 1,900 no. residential units, a primary school for c. 600 no. pupils, a secondary school for c. 1,000 no. pupils and a local centre of 2,500sqm. Kellystown is located approximately 1.5 km south-west of Blanchardstown Town Centre, 1.8 km south-west of Blanchardstown Main Street and 9.8 km north-west from O'Connell Street, Dublin.

The Proposed Development- Plot 2 (St. Mochta's LRD) site is bounded to the west and south by the under construction Kellystown development -Phase1- (Planning Application Reg. Ref. No.

SHDW/004/21), to the east by the elevated Diswellstown Road and to the north by railway infrastructure. The subject development is proposed to be built on land currently occupied by St Mochta's football club.

The proposed development Plot 2 comprises of 302no. residential units in a mix of houses, duplex and apartment units consisting of 62no. 2 storey, 3-bedroom houses and 35no. 3 storey, 4no. bedroom houses; 205no. Duplex / Apartment Units (98no. 1-bed, 88no. 2-bed and 19no. 3-bed) across 4no. blocks comprising: Block D ranging in height from 5-7 storeys accommodating 57no. apartment units; Block E ranging in height from 5-7 storeys accommodating 77no. apartment units; Block F ranging in height from 4-5 storeys accommodating 39no. apartment and duplex units; Duplex Blocks G1, G2, G3 & G4 3 storeys in height accommodating 32no. apartment units; and all associated and ancillary site development and infrastructural works, hard and soft landscaping and boundary treatment works, including public open space; public lighting; surface car parking spaces; bicycle parking spaces/stores for mid-terrace units; bin stores. Vehicular access to the proposed development is provided by the road network permitted under Reg. Ref. ABP-312318-21, as amended by Reg. Ref. LRD0034-S3.

12.5.2.1 Construction Stage Noise

The noise and vibration effects have been considered for both the construction and operational phases of the scheme. During the construction stage of the scheme there will be various sources of noise and vibration from mobile plant and construction activities.

12.5.2.2 Operational Stage Noise

The primary sources during the operational phase will be long term and include additional traffic and noise from external amenity spaces.

12.6 Construction and Operational Phase Assessment Criteria

This section outlines the assessment criteria and potential impact from the construction phase and operational phase of the proposed development.

12.6.1 Assessment Criteria for Construction Phase Noise

Noise limits outlined in BS5228-1:2009+A1 have been adopted as the criteria for this project. BS5228-1 takes into consideration the impact of the ambient noise at the noise sensitive receptor as follows:

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

Table 12-10: BS5228 Threshold Levels

Note 1:Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are less than these values.
Note 2 Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are the same as category A values.

Note 3:Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are higher than category B values.
Note 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, educational establishment, hospital or similar institution, or any other property likely to be adversely affected by an increase in noise level".

12.6.2 Assessment Criteria for Construction Phase Vibration

The Dublin Agglomeration Noise Action Plan – Chapter 13 does not contain guidance relating to vibration limits. Best practice guidance is taken from British Standard BS 5228:2009 + A12014 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 values (in terms of peak particle velocity) at the closest part of sensitive property to the source of vibration are outlined in Table 12-3 below.

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 4Hz**	**15 to 40Hz**	**40Hz and above**
Light framed structures/ residential buildings	15 mm/s	20 mm/s	50 mm/s

Table 12-3: BS 5228:2009 + A1 2014 Allowable Vibration Values

12.6.3 Assessment Criteria for Operational Phase Noise

The main potential source of operational noise from the development is traffic movements and car parking, external/public amenity spaces.

The Dublin Agglomeration Noise Action Plan – Chapter 13 doesn't specify any operation noise limits typically most councils define these as follows:

- Daytime 55 dB (A) Leq
- Night-time 45 dB (A) Leq (or exceptionally 40 dB(A) Leq)

In order to assist with the interpretation of the noise associated with vehicular traffic on public roads, Table 12-4 below offers guidance as to the likely impact associated with any particular change in traffic noise level (Source DMRB, 2011).

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

Table 12-4: Magnitude of impacts

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

12.6.4 Assessment Criteria for Operational Phase Vibration

Operational vibration affecting noise sensitive locations has been scoped out as there are no known significant vibration sources associated with the Proposed Development - Plot 1 (Luttrellstown Gate Phase 2) or the Proposed Development- Plot 2 (St. Moctha's LRD). There are no significant operational vibration impacts. Baseline vibration monitoring was not undertaken within the proposed development site.

12.7 Predicted Impact of Proposed Development - Plot 1 (Luttrellstown Gate Phase 2)

12.7.1 Construction Phase

The construction phase noise impact of the Proposed Development - Plot 1 (Luttrellstown Gate Phase 2)) considers the following;

- Noise sources;
- Construction Phase Vibration
- Construction Noise Limits
- Construction Noise Predictions; and
- Construction Traffic Noise.

12.7.1.1 Noise Sources

The construction of the Proposed Development - Plot 1 (Luttrellstown Gate Phase 2) will involve several phases, including site setup, substructure, superstructure, and external and internal finishes. During these phases, noise will be generated from various construction activities, including the operation of heavy machinery and equipment. Given the existing noise environment and the distance between the development and surrounding noise-sensitive receptors, mitigation measures will be necessary to control the potential noise impact. These measures may include the use of site hoarding to provide screening, local screening around particularly noisy plant and equipment, and the selection of low-noise plant where possible. Likely construction plant equipment is outlined below and broken down to the predicted usage during each construction phase.

Construction Phase	Item of Plant (BS 5228-1:2009+A1:2014 Ref)	Noise Level (L_{Aeq} at 10m dB(A))	On Time of 10 hr day
Site Setup	Digger	77	4 hours
	Carpentry tools	78	2 hours
	Skill saw	84	2 hours
Substructure	Excavators	77	2 Hours
	Concrete breaker	92	2 Hours
	Con saws	84	6 Hours
	Rail saw	85	2 Hours
	Drills (into concrete)	89	2 Hours
	Tower Crane	77	6 Hours
	Dumper 7t	81	6 Hours
	Cement Mixer (Discharging	75	6 Hours
	Lorry Idling	80	4 Hours
	Telescopic Handler	71	6 Hours
	Tower Crane Generator	82	10 Hours
	Concrete Pump	78	3 Hours
	Vibrodisplacement and Stone Columns	80	1 Hours
Superstructure	Tower Crane	77	6 Hours
	Tower Crane Generator	82	10 Hours
	Drills (into concrete)	89	2 Hours
	Power tools	70	4 Hours
	Impact steel	69	2 Hours
	Hammer	69	1 Hour
	Dumper 7t	81	6 Hours
	Cement Mixer (Discharging	75	2 Hours
	Lorry Idling	80	5 Hours
	Telescopic Handler	71	8 Hours
	Concrete Pump	78	1 hour

Construction Phase	Item of Plant (BS 5228-1:2009+A1:2014 Ref)	Noise Level (L_{Aeq} at 10m dB(A))	On Time of 10 hr day
External finishes	Hand Tools	70	5 Hours
	Con saw	84	2 Hours
	Vibratory Roller	82	4 Hours
	Ashpalt Paver and Tipper	85	3 Hours
	Excavators	77	2 Hours
Internal finishes	n/a	n/a	n/a

Table 12-5: Predicted Construction Operations For Plot 1 Construction Phase

12.7.1.2 Construction Phase Vibration

Vibration impact is not anticipated for most of the construction phase, some vibration is expected to be generated during the substructure stage where earthworks are likely. During this phase, compliance with vibration criteria is evaluated using a combination of measured data and general estimates, as predicting vibration impacts 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 BS5228-2, provide a practical method for assessing potential impacts, as outlined below in Table 12-6.

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

Table 12-6: Construction Phase Vibration Limits

12.7.1.3 Construction Noise Limits

The criteria for the project is based on the criteria outlined in Table 12- above and the background noise in the area. The project criteria for construction noise is outlined below in Table 12-7 distance to the NSLs is based on the closest receiver for each NSL where the NSL reflects a number of houses/sensitive receivers at each NSL. Reference to the baseline survey results and guidance contained in BS 5228 Part 1 for construction noise levels threshold for significance affect from constriction activities is set as follows for the closest noise sensitive locations.

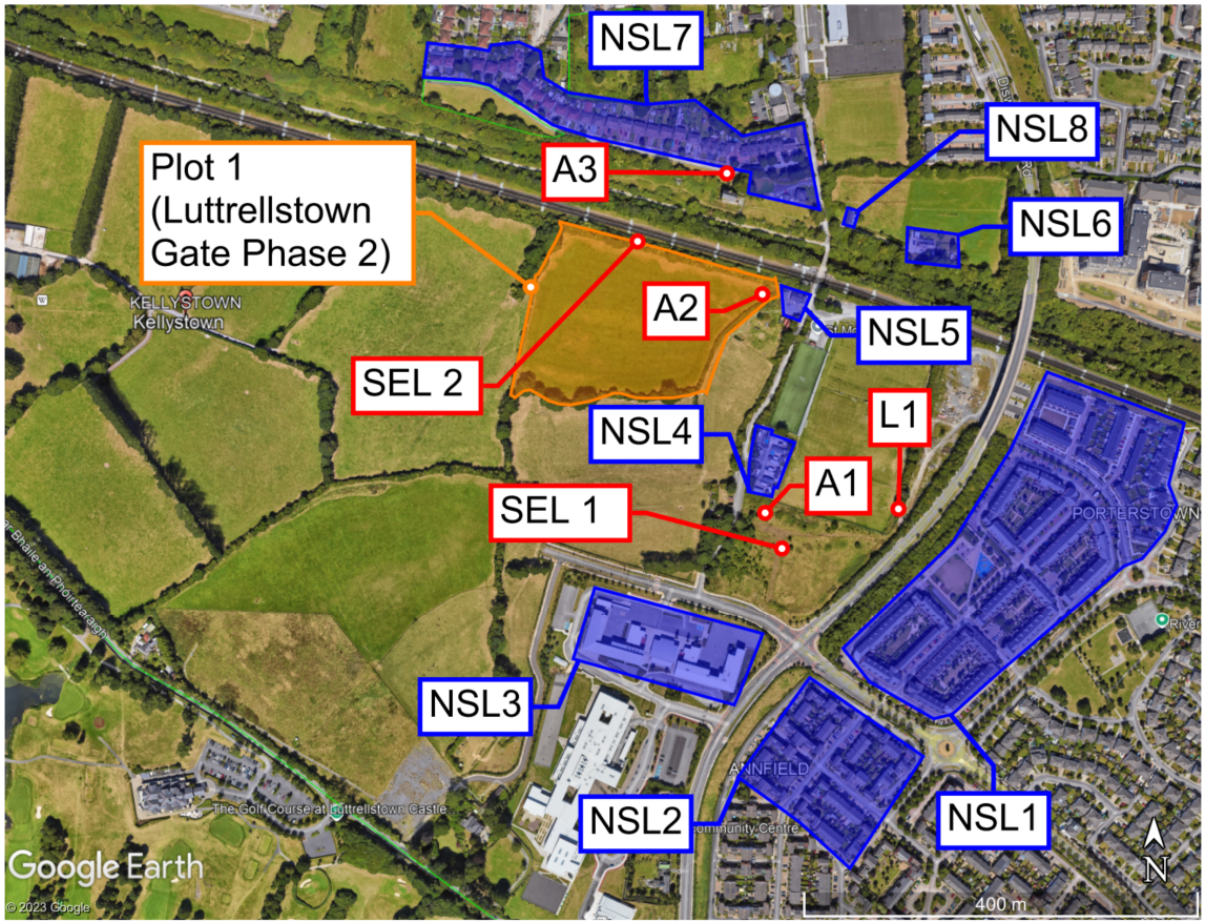

Figure 12-4: Plot 1 Site Location, Measurement Locations L1,A1-A3, Sels and Noise Sensitive Locations

Noise Sensitive Location	*Distance To the Centre of The Site (m)*	*Ambient Noise dB(A) Leq*	*Noise Limit dB(A) [1] Leq*
NSL1	415	62	65
NSL2	425	62	65
NSL3	290	62	65
NSL4	190	53	65
NSL5	160	52	65
NSL6	290	52	65
NSL7	160	50	65
NSL8	240	50	65

Table 12-7: Construction Noise Limits For Plot 1

1) 65 dB (A) upper threshold limit

For the appropriate assessment period (i.e. daytime in this instance) 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.

For large infrastructure projects a limit of 65dB(A) is set as the appropriate the upper limit for construction noise within urban areas near main roads in heavy industrial areas. This is considered an appropriate upper limit for construction noise.

12.7.1.4 Construction 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 12-5. The noise sources are assumed to be located at the centre of the site. The prediction methodology in BS5228 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 the residential dwellings with a line of sight to the proposed development located at NSL4 and NSL5 in Figure 12.4 above.

Using construction plant noise levels outlined above, predicted construction noise levels at each noise sensitive location has been calculated. Table 12-8 below summarises the predicted construction noise level at each noise sensitive location. Examination of the results indicate the construction noise without mitigation is predicted to achieve the noise limits during all stages of the development.

Location	Noise Limit	Predicted Cumulative Noise Level (Construction Noise + Ambient) With no mitigation L_{Aeq}, dB			
		Site Set Up	Substructure	Superstructure	External finishes
NSL1	65 dB	62	63	62	62
NSL2	65 dB	62	63	62	62
NSL3	65 dB	50	63	63	62
NSL4	65 dB	56	62	59	53
NSL5	65 dB	57	63	60	54
NSL6	65 dB	55	59	57	53
NSL7	65 dB	57	63	60	54
NSL8	65 dB	54	60	57	53

Table 12-8: Plot 1 Predicted Noise Levels Without Mitigation For Each Stage

The calculations set out above are based on assumed site construction works and a combination of the plant operating at the same time i.e. worst-case scenario on each site at the same time. In reality this will not be the case however the assessment has been based on wors case scenario.

Noise mitigation measures are not required to reduce the impact of construction noise any stages of construction of Plot 1 (Luttrellstown Gate Phase 2). However, where required, noise mitigation measures have been outlined below to reduce the possible impact of construction noise.

12.7.1.5 Construction Traffic Noise

Construction traffic volumes provided by Waterman Moylan Consulting Engineers Limited state that during the construction phase of the Proposed Development - Plot 1 (Luttrellstown Gate Phase 2) the AADT will be approx. 181 No. two-way trips, which includes HGV and workforce movements. It is anticipated that the worst-case scenario will occur during excavation phase, during which a total of 54 No. two-way HGV trips per day are estimated.

The Design Manual for Roads and Bridges (DMRB) states that it takes a 25% increase in traffic flows in order to get a 1dBA increase in traffic noise levels. Traffic flow increases associated with the proposed development will be significantly less than 25% and hence traffic noise level increases will be significantly less than 1dBA.

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 & Noise).

Construction traffic noise levels associated with the Proposed Development - Plot 1 (Luttrellstown Gate Phase 2) will not have a negative impact on nearby noise sensitive locations (NSLs). The magnitude of effect is no impact.

Magnitude of Impact	Increase in Traffic Noise Levels (dB)
No Impact	Less than 1.0
Minor	Greater than or equal to 1.0 and less than 3.0
Moderate	Greater than or equal to 3.0 and less than 5.0
Major	Greater than or equal to 5.0

Table 12-9: Likely Effect Associated with Change in Construction Traffic Noise Levels

12.7.2 Operational Stage

12.7.2.1 Assessment of Operational Noise

This section includes an assessment of the operational noise impacts for noise from plant noise, communal amenity space and road traffic noise.

Based on the information provided by the design team. The plant and equipment for the project has not been determined at this time. The heating and cooling methodology will be developed as part of the design development stage; therefore, plant noise limits have been set out in this section of the report. As part of the building design an acoustic consultant should be engaged to review the plant noise emissions from the development to ensure that the upper noise limits outlined in this report are achieved.

The operational noise impact of the Proposed Development - Plot 1 (Luttrellstown Gate Phase 2) considers the following;

- Operational Noise Sources
- Operational Phase Vibration
- BS4142 Assessment

12.7.2.2 Operational Noise Sources

12.7.2.2.1 Plant Noise

The Operational external mechanical plant and equipment associated with residential units is not available at this stage. 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 L_{A90} measurements from the daytime L_{A90}, 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 12-10 below contains the daytime and nighttime noise threshold limit to be adhered to for any plant/equipment noise from the proposed development at the nearest noise sensitive locations (NSL 5).

Noise Sensitive Location	Background Sound Levels LA90 dB	Penalty for Tonality dB(A)	Derived Noise Threshold Limit dB(A) Leq at Noise Sensitive Receptors
5	49 (Daytime)	TBC	49
	40 (Night-time)	TBC	39

Table 12-10**:** Derived Noise Threshold Limits for Plant/Equipment Noise

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

12.7.2.2.2 Operational Traffic Noise

Operational phase traffic volumes have been provided by Waterman Moylan Consulting Engineers Limited for use in this chapter. Figure 12-5

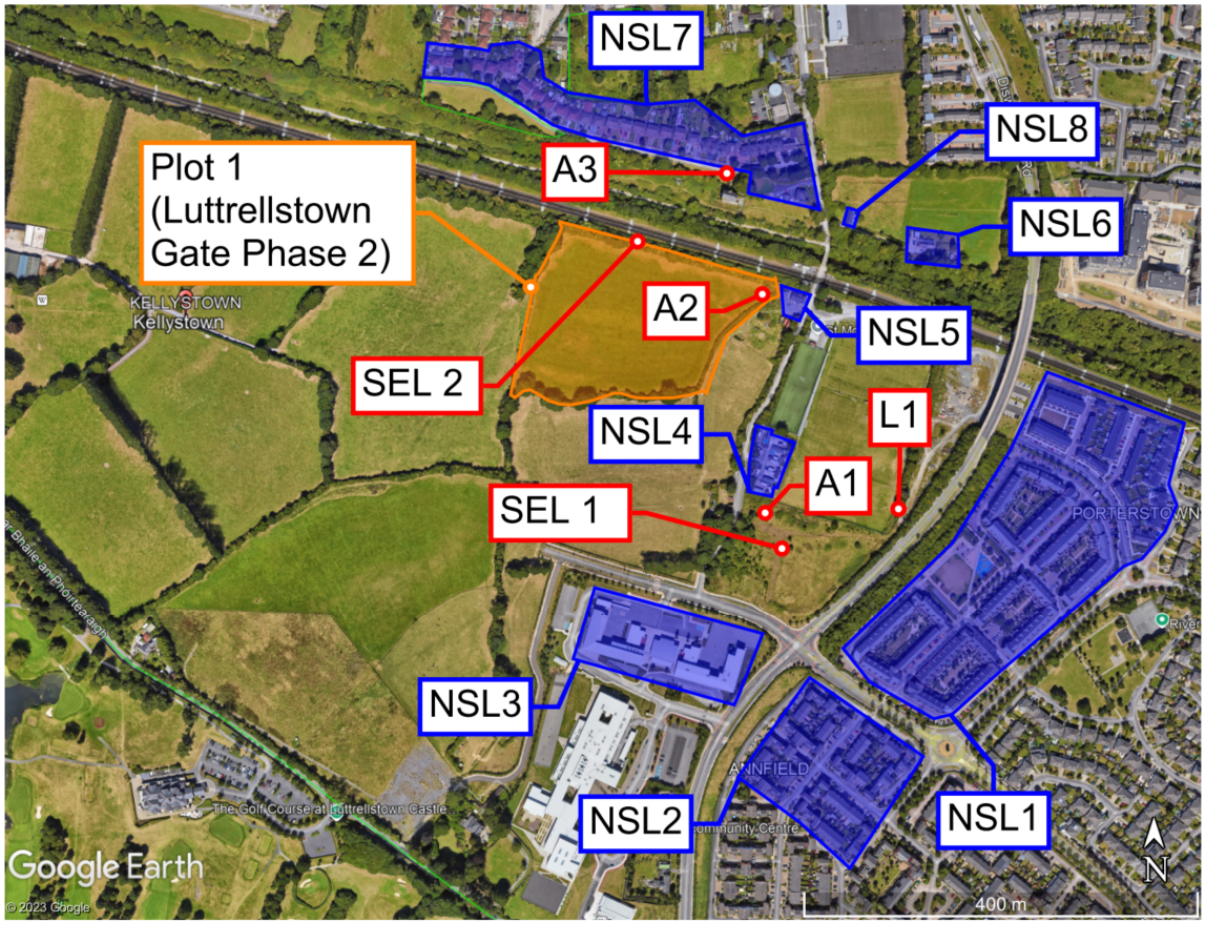

Figure 12-4 below outlines the operational traffic volumes for the base year "Do-Nothing" and "Do-Something" scenarios for the years 2030, 2035 and 2040.

Operational traffic volumes can be read in detail in the traffic and transport chapter.

Kellystown AADT Data

Junction Number	Name	Arm Orientation	Survey Flows	DO NOTHING SCENARIOS			DO SOMETHING SCENARIOS			%HGV	Speed (kph)	Link Length
				2030	*2035*	*2045*	*2030*	*2035*	*2045*			
1	Clonsilla Road (R121)	West	11865	13025	13075	13455	13095	13075	13455	1.10%	50	100
	Clonsilla Road (R121)	East	12335	13535	13594	13988	13605	13594	13988	1.16%	50	100
	Porterstown Road	South	3993	4328	4400	4528	4328	4400	4528	0.96%	50	100
2	Blanchardstown Road South (R121)	North	18077	20286	21700	22278	20749	22335	22914	2.12%	50	100
	Clonsilla Road (R121)	East	13110	14545	15316	15736	14859	16001	16420	1.60%	50	100
	Diswellstown Road	South	19888	22683	24649	25285	23703	25598	26235	1.50%	50	100
	Clonsilla Road (R121)	West	5820	6472	6413	6599	6542	6413	6599	1.08%	50	100
3	Kellystown Link Road	West	1167	3587	10135	10173	6849	11695	11732	0.33%	50	100
	Porterstown Road - Pedestrian Route	North	0	0	0	0	0	0	0	0.27%	50	100
	Kellystown Link Road	East	1167	5097	10135	10173	6888	11695	11732	0.18%	50	100
4	Diswellstown Road	North	19647	23509	27055	27684	24276	28005	28633	1.52%	50	100
	Diswellstown Road	East	11204	13117	14846	15205	13561	15290	15649	0.77%	50	100
	Porterstown Link Road	South	14071	15937	16519	16970	16277	16701	17151	1.67%	50	100
	Kellystown Link Road	West	1718	5730	10809	10864	7528	12384	12439	0.34%	50	100
5	Riverwood Distributor Road	North	6313	7527	8739	8941	7841	9053	9255	0.54%	50	100
	Diswellstown Road	East	5641	6410	6961	7142	6540	7091	7272	0.95%	50	100
	Riverwood Distributor Road	South	2796	3031	3081	3171	3031	3081	3171	0.23%	50	100
	Diswellstown Road	West	4926	6320	7957	8114	6764	8400	8558	0.77%	50	100
6	Luttrellstown Road	West	10535	11747	11610	11947	11923	11610	11947	1.63%	60	100
	Porterstown Link Road	North	13168	14990	15514	15935	15343	15690	16112	1.82%	50	100
	Porterstown Road	East	8595	9706	10475	10750	9883	10651	10927	1.36%	50	100
7	Kellystown Link Road	West	0	0	6161	6161	0	6511	6511	1.50%	50	100
	Access to Subject Development	North	0	3482	3508	3508	5389	5418	5418	0.00%	30	50
	Kellystown Link Road	East	0	3832	8841	8841	5623	10401	10401	1.50%	50	100
	Access to New St. Mochta's Sportsground	South	0	765	604	604	882	604	604	0.30%	30	50

Figure 12-5: Kellystown AADT Data

The Design Manual for Roads and Bridges (DMRB) states that it takes a 25% increase in traffic flows in order to get a 1dBA increase in traffic noise levels. Traffic flow increases associated with the proposed development will be significantly less than 25% and hence traffic noise level increases will be significantly less than 1dBA.

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 & Noise).

Operational traffic noise levels associated with the Proposed Development - Plot 1 (Luttrellstown Gate Phase 2) will not have a negative impact on nearby noise sensitive locations (NSLs). The magnitude of effect is no impact.

Magnitude of Impact	**Increase in Traffic Noise Levels (dB)**
No Impact	Less than 1.0
Minor	Greater than or equal to 1.0 and less than 3.0
Moderate	Greater than or equal to 3.0 and less than 5.0
Major	Greater than or equal to 5.0

Table 12-11: Likely Effect Associated With Change In Construction Traffic Noise Levels

12.7.2.2.3 Noise From Communal Amenity Space

The operational phase of the proposed development will feature noise from the usage of external amenity spaces located around the development. A noise model has been created to predict the operational noise levels from proposed amenity spaces on the nearest noise sensitive locations. For the purpose of the model it is assumed the amenity space will be operational during daytime hours 16:00hrs-23:00hrs with a worst-case scenario assuming 30 persons within the amenity space with 1 in 3 talking. Table 12-20 below outlines the noise spectrum used to model an amenity space with up to 30 persons.

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**	
1 person speaking with normal voice. (30 persons per source with 1 in 3 talking at once)	56	58	67	69	63	59	55	50	69

Table 12-12: External Amenity Space Sound Power Spectrums

Figure 12-6 illustrates the location of the amenity space most relevant to the nearest noise sensitive location, NSL 5.

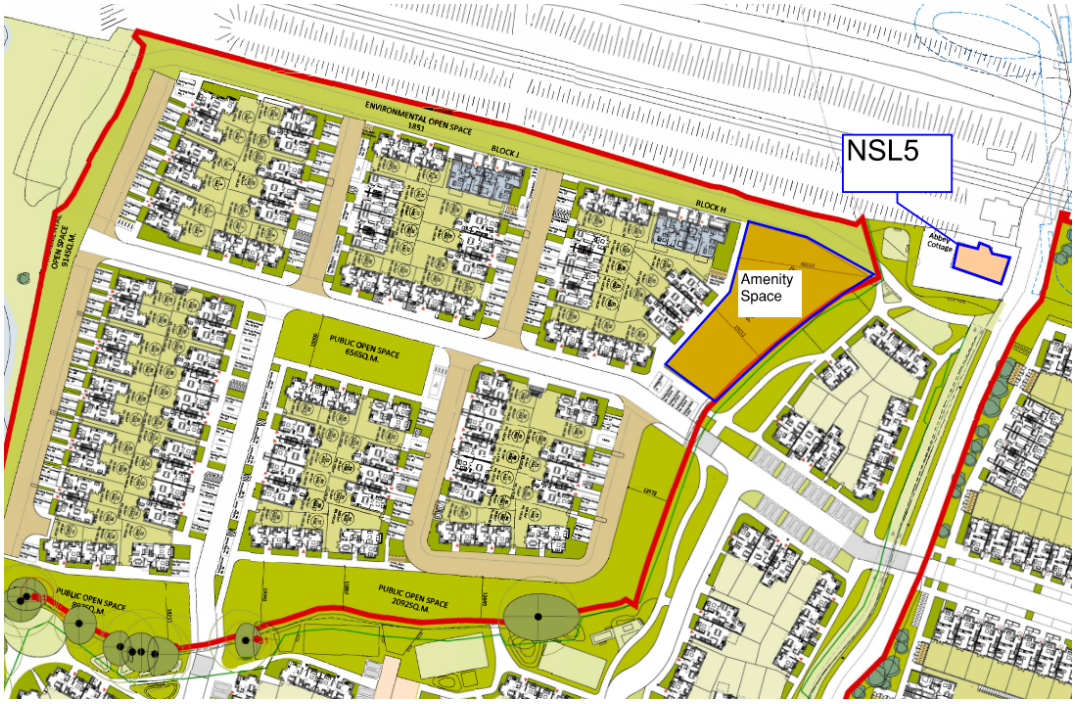

Figure 12-6: Amenity Space and Closest NSL

The distance from the closest boundary of the amenity space highlighted in Figure 12-6 above to the closest facade of NSL 5 is approx. 30m. Using the external amenity space sound power spectrums outlined in Table 12-20 above and distances measured, a noise model was created to predict the operational noise impact of the amenity space on the closest noise sensitive location.

Table 12-13 below outlines the predicted operational amenity noise levels on the closest noise sensitive locations, NSL 5.

Amenity Space	Distance to Nearest NSL (NSL 5)	Overall Sound Pressure Level dBA Leq
30 people of which 1 in 3 are speaking with normal voice. (30 persons per source with 1 in 3 talking at once)	30m	18.5

Table 12-13: Predicted Operational Amenity Space Noise levels at Closest NSL

Predicted noise levels outlined in Table 12-13 above are calculated using free field conditions and are therefore a worst-case scenario.

BS8233:2014 provides guidance values for a range of ambient noise levels within residential properties. These internal ambient noise levels are illustrated in Table 12-14 below.

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living Room	35 dB LAeq,16hr	-

Activity	Location	07:00 to 23:00	23:00 to 07:00
Dining	Dining Room/Area	40 dB LAeq,16hr	-
Sleeping (Daytime Resting)	Bedroom	35 dB LAeq,16hr	30 dB LAeq, 8hr

Table 12-14: BS8233:2014 Internal Ambient Noise Levels

Predicted operational amenity space noise levels outlined in 12.21 above illustrate that the appropriate internal noise levels at the nearest noise sensitive location to the proposal will not be exceeded as a result of operational amenity space noise levels from the proposed development. The nearest facades of the proposed development have also been considered, given the low noise impact from these amenity spaces it is not predicted it will have a negative impact.

12.7.2.3 Operational Phase Vibration

Operational vibration affecting noise sensitive locations has been scoped out as there are no known significant vibration sources associated with the operational phase of Proposed Development - Plot 1 (Luttrellstown Gate Phase 2).

12.7.2.4 BS4142 Assessment

Operational noise sources illustrate compliance with noise criteria guidance.

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 as outlined in the previous sections. As the design progresses and details of any proposed external mechanical plant and equipment becomes available it should be assessed for compliance with BS 4142.

12.8 Predicted Impact of Proposed Development- Plot 2 (St. Mochta's LRD)

12.8.1 Construction Phase

The construction phase noise impact of the Proposed Development- Plot 2 (St. Mochta's LRD) considers the following;

- Noise sources
- Construction Phase Vibration
- Construction Noise Limits
- Construction Noise Predictions; and
- Construction Traffic Noise.

12.8.1.1 Noise Sources

The construction of the Proposed Development- Plot 2 (St. Mochta's LRD) will involve several phases, including site setup, demolition, substructure, superstructure, and external and internal finishes. During these phases, noise will be generated from various construction activities, including the operation of heavy machinery and equipment. The demolition will be localised to the existing St Mochta's FC single storey clubhouse and changing facilities located to the northwest of the site.

Given the existing noise environment and the distance between the development and surrounding noise-sensitive receptors, mitigation measures will be necessary to control the potential noise impact. These measures may include the use of site hoarding to provide screening, local screening around particularly noisy plant and equipment, and the selection of low-noise plant where possible. Likely construction plant equipment is outlined below and broken down to the predicted usage during each construction phase.

Construction Phase	Item of Plant (BS 5228-1:2009+A1:2014 Ref)	Noise Level (L_{Aeq} at 10m dB(A))	On Time of 10 hr day
Site Setup	Digger	77	4 Hours
	Carpentry tools	78	2 Hours
	Skill saw	84	2 Hours
Demolition	Excavators	77	2 Hours
	Concrete breaker	92	2 Hours
	Pulveriser mounted on excavator	80	2 Hours
	Hand held pneumatic breaker	83	2 Hours
	Drills (into concrete)	89	2 Hours
	Dumper 7t	81	5 Hours
	Lorry Idiling	80	3 Hours
	Telescopic Handler	71	5 Hours
Substructure	Excavators	77	2 Hours

Construction Phase	Item of Plant (BS 5228-1:2009+A1:2014 Ref)	Noise Level (L_{Aeq} at 10m dB(A))	On Time of 10 hr day
	Concrete breaker	92	2 Hours
	Con saws	84	6 Hours
	Rail saw	85	2 Hours
	Drills (into concrete)	89	2 Hours
	Tower Crane	77	6 Hours
	Dumper 7t	81	6 Hours
	Cement Mixer (Discharging	75	6 Hours
	Lorry Idling	80	4 Hours
	Telescopic Handler	71	6 Hours
	Tower Crane Generator	82	10 Hours
	Concrete Pump	78	3 Hours
	Vibrodisplacement and Stone Columns	80	1 Hours
Superstructure	Tower Crane	77	6 Hours
	Tower Crane Generator	82	10 Hours
	Drills (into concrete)	89	2 Hours
	Power tools	70	4 Hours
	Impact steel	69	2 Hours
	Hammer	69	1 Hour
	Dumper 7t	81	6 Hours
	Cement Mixer (Discharging	75	2 Hours
	Lorry Idling	80	5 Hours
	Telescopic Handler	71	8 Hours
	Concrete Pump	78	1 hour
External finishes	Hand Tools	70	5 Hours
	Con saw	84	2 Hours
	Vibratory Roller	82	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 10 hr day
	Ashpalt Paver and Tipper	85	3 Hours
	Excavators	77	2 Hours
Internal finishes	n/a	n/a	n/a

Table 12-15: Predicted Construction Operations for Plot 2 Construction Phase

12.8.1.2 Construction Phase Vibration

Vibration impact is not anticipated for most of the construction phase, some vibration is expected to be generated during the substructure stage where earthworks are likely. During this phase, compliance with vibration criteria is evaluated using a combination of measured data and general estimates, as predicting vibration impacts 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 BS5228-2, provide a practical method for assessing potential impacts, as outlined below in Table 12-16

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

Table 12-16: Construction Phase Vibration Limits

12.8.1.3 Construction Noise Limits

The criteria for the project is based on the criteria outlined in Table 12- above and the background noise in the area. The project criteria for construction noise is outlined in Table 12-25. Distances to the nearest NSLs has been calculated based on the closest receiver for each NSL, where the NSL reflects a number of houses/sensitive receivers. Reference to the baseline survey results and guidance contained in BS 5228 Part 1 for construction noise levels threshold for significance affect from constriction activities is set as follows for the closest noise sensitive locations.

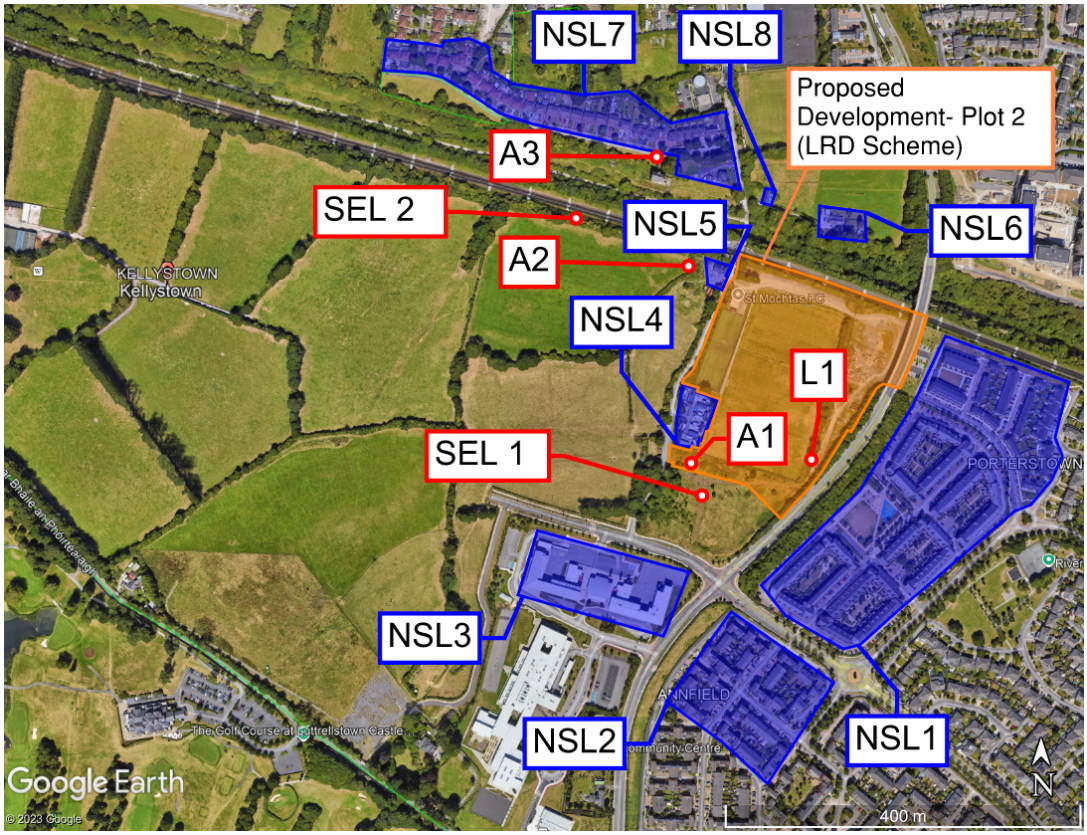

Figure 12-7: Plot 2 Site Location, Measurement Locations L1,A1-A3, Sels and Noise Sensitive Locations

Noise Sensitive Location	*Distance To the Centre of The Site (m)*	*Ambient Noise dB(A) Leq*	*Noise Limit dB(A) [2] Leq*
NSL1	150	62	65
NSL2	260	62	65
NSL3	270	62	65
NSL4	90	53	65
NSL5	130	52	65
NSL6	185	52	65
NSL7	280	50	65
NSL8	180	50	65

Table 12-17: Construction Noise Limits for Plot 2

2) 65 dB (A) upper threshold limit

For the appropriate assessment period (i.e. daytime in this instance) 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. For large infrastructure projects a limit of 65dB(A) Leq is set as the appropriate the upper limit for construction noise within

urban areas near main roads in heavy industrial areas. This is considered an appropriate upper limit for construction noise.

12.8.1.4 Construction 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 12-23 above. The noise sources are assumed to be located at the centre of the site for the site setup, substructure, superstructure and external finishes stages. For the demolition the noise sources are assumed to be at the centre of the St Mochta's FC building which is to be demolished located at the northwest corner of the site. The prediction methodology in BS5228 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 the residential dwellings with a line of sight to the proposed development located at NSL4 and NSL5 in Figure 12.8 above.

Using construction plant noise levels outlined in Table 12-23 above, predicted construction noise levels at each noise sensitive location has been calculated. Table 12-26 below summarises the predicted construction noise level at each noise sensitive location. Examination of the results indicate the construction noise without mitigation is predicted to exceed the noise limits at some NSLs during the substructure and demolition stages of the development.

Location	Noise Limit	Predicted Cumulative Noise Level (Construction Noise + Ambient) With no mitigation L_{Aeq}, dB				
		Site Set Up	Demolition	Substructure	Superstructure	External finishes
NSL1	65 dB	63	64	66	64	62
NSL2	65 dB	62	63	64	63	62
NSL3	65 dB	51	64	64	63	62
NSL4	65 dB	61	67	68	65	55
NSL5	65 dB	59	77	65	62	54
NSL6	65 dB	57	66	62	59	53
NSL7	65 dB	55	66	59	57	53
NSL8	65 dB	56	67	62	60	53

Table 12-18: Plot 2 Predicted Noise Levels Without Mitigation for Each Stage

The calculations set out above are based on assumed site construction works and a combination of the plant operating at the same time i.e. worst-case scenario on each site at the same time. In reality this will not be the case however the assessment has been based on wors case scenario.

Table 12-27 below highlights the noise reduction required at each stage of construction works to ensure compliance with the 65dB(A) construction noise limit.

Location	Noise Limit dBA Leq	Noise reduction required at each stage of works to meet criteria (dBA) Leq				
		Site Set Up	Demolition	Superstructure	External finishes	External finishes
NSL1	65 dB	0	0	1	0	0
NSL2	65 dB	0	0	0	0	0
NSL3	65 dB	0	0	0	0	0
NSL4	65 dB	0	2	3	0	0
NSL5	65 dB	0	12	0	0	0
NSL6	65 dB	0	1	0	0	0
NSL7	65 dB	0	1	0	0	0
NSL8	65 dB	0	2	0	0	0

Table 12.19: Attenuation Required Based on Plot 2 Construction Noise Predictions

Noise mitigation measures will be required at demolition and substructure stages of construction. A combination of the mitigation measures outlined in Noise Mitigation Recommendations should be used to reduce the levels of construction noise by the values listed in Table 12-27 above.

12.8.1.5 Construction Traffic Noise

Construction traffic noise levels assessed in this Chapter is representative of construction traffic for the whole proposed development site (inclusive of Plot 1 and Plot 2) and therefore has not been reassessed in this Section.

12.8.2 Operational Stage

12.8.2.1 Assessment of Operational Noise

The operational noise impact of the Proposed Development - Plot 2 (St. Mochta's LRD) considers the following;

- Operational Noise Sources.
- Operational Phase Vibration.
- BS4142 Assessment.

12.8.2.2 Operational Noise Sources

12.8.2.2.1 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 12-28 below contains the daytime and nighttime noise threshold limit to be adhered to for any plant/equipment noise from the proposed development at the nearest noise sensitive locations (NSL 5).

Noise Sensitive Location	Background Sound Levels LA90 dB	Penalty for Tonality dB(A)	Derived Noise Threshold Limit dB(A) Leq at Noise Sensitive Receptors
5	49 (Daytime)	TBC	49
	40 (Night-time)	TBC	39

Table 12-20: Derived Noise Threshold Limits for Plant/Equipment Noise

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

12.8.2.2.1 Operational Traffic Noise

Operational traffic noise assessed in Section 12.6.2 of this Chapter is representative of operational traffic for the whole proposed development site (inclusive of Plot 1 and Plot 2) and therefore has not been reassessed in this Section.

12.8.2.2.2 Noise from Communal Amenity Space

The operational phase of the proposed development will feature noise from the usage of external amenity spaces located around the development. A noise model has been created to predict the operational noise levels from proposed amenity spaces on the nearest noise sensitive locations. For the purpose of the model it is assumed the amenity space will be operational during daytime hours 16:00hrs-23:00hrs with a worst-case scenario assuming 30 persons within the amenity space with 1 in 3 talking. Table 12-29 below outlines the noise spectrum used to model an amenity space with up to 30 persons.

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	
Male talker with normal voice. (30 persons per source with 1 in 3 talking at once)	56	58	67	69	63	59	55	50	69

Table 12-21: External Amenity Space Sound Power Spectrums

Figure 12.9 below illustrates the location of the amenity space most relevant to the nearest noise sensitive location, NSL 4.

Figure 12.8**:** Amenity Space and Closest NSL

The distance from the closest boundary of the amenity space highlighted in Figure 12.9 above to the closest facade of NSL 4 is approx. 100m. Using the external amenity space sound power spectrums outlined in Table 12-29 above and distances measured, a noise model was created to predict the operational noise impact of the amenity space on the closest noise sensitive location.

Table 12-30 below outlines the predicted operational amenity noise levels on the closest noise sensitive locations, NSL 5.

Amenity Space	Distance to Nearest NSL (NSL 4)	Overall Sound Pressure Level dBA Leq
(30 persons per source with 1 in 3 talking at once)	100m	8.1

Table 12-22: Predicted Operational Amenity Space Noise levels at Closest NSL

Predicted noise levels outlined in Table 12.30 above are calculated using free field conditions and are therefore a worst-case scenario. The noise impact to the proposed development from the amenity spaces has also been considered. Given the low noise levels generated in the amenity spaces it is not predicted they will provide a negative noise impact.

12.8.3 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 impact with the ProPG risk categories a baseline noise survey was undertaken on the site to quantify the existing noise environment.

Pro PG Risk Analysis.

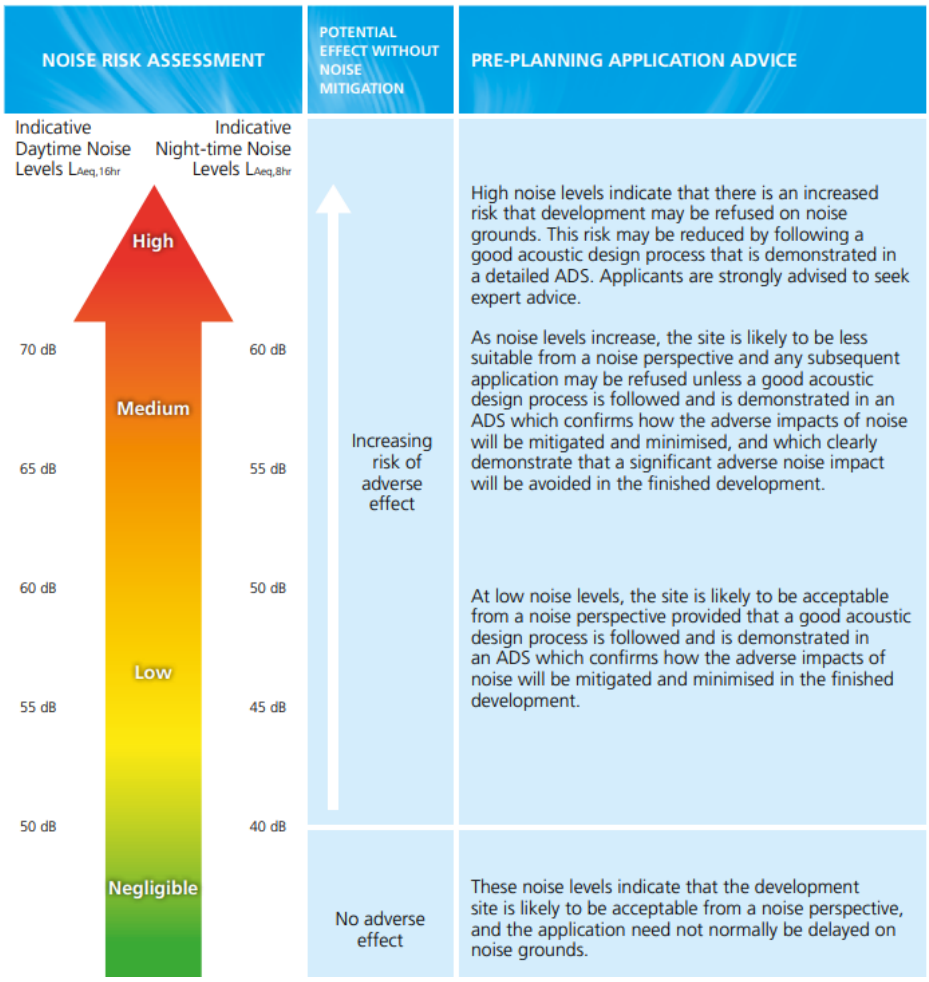

Figure 12-: ProPG

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

12.8.3.1 Element 1: Good Acoustic Design Process

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."

12.8.3.2 Discussion of Good Acoustic Design

12.8.3.2.1 Mitigation of Sources

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

12.8.3.2.2 Site Layout and Orientation

The development borders the Diswellstown Road which is to the West of Plot 2, the Dublin Rail line borders the site to the North of both plot 1 and plot 2.

12.8.3.2.3 Impact 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.

12.8.3.2.4 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 in section 12.8.3.4.

12.8.3.3 Element 2 – Assessment of Internal Noise Levels

This section outlines the assessment of the building envelope including the façade noise modelling, and specification of the glazing requirements.

A noise intrusion assessment for the proposed development has been completed in accordance with the methodology outlined International Standard ISO EN 12354-3:2017 Building acoustics — Estimation of acoustic performance of buildings from the performance of elements — Part 3: Airborne sound insulation against outdoor sound. The standard provides a method for calculating the indoor noise levels due to for instance road traffic noise.

The calculation method accounts for multiple factors including:

- The external noise level at the affected building façade.
- The frequency characteristics of the specific noise source (i.e. road traffic noise).
- The sound insulation performance of each façade element (i.e. Windows, Walls, Roof…).
- The area of each façade element.
- Direct and flanking transmission paths.

This section outlines the building envelope requirements based on the measurements outlined in Section 12.4.1. 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 measured and predicted façade day and night noise levels, the room and facade dimensions from the drawings provided.

The building envelope specification should be confirmed by the acoustic consultant at design stage once the internal layouts and building envelope 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.

12.8.3.3.1 Glazed Elements and Ventilation

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 12-23 below.

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 12-23 below are considered to provide adequate sound insulation to achieve the relevant day and night internal design goals respectively.

Façade	Glazed Elements (Frame & Glazing) Sound Insulation Requirements (Indicative requirements equal or approved)							Façade Ventilation Requirement[2]
	Octave Band Frequency Requirements1 R dB						Glazing Acoustic Performance dB Rw	
	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz		
BLUE	28	23	32	38	42	44	35dB Rw	37dB Dn,e,w (1)
RED	20	20	28	35	40	42	32dB Rw	34dB Dn,e,w (1)

Façade	Glazed Elements (Frame & Glazing) Sound Insulation Requirements (Indicative requirements equal or approved)							Façade Ventilation Requirement[2]
	Octave Band Frequency Requirements1 R dB						Glazing Acoustic Performance dB Rw	
	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz		
All OTHER Facades	Standard Double Glazing[3]							–Standard Vents

Table 12-23: Façade Requirements

1. Natural ventilation assumed throughout, the performance cited for the ventilator is in the open position. 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 above specification.
3. Standard double glazing assumes a construction of two panes of 3mm glass with a 10mm cavity achieving a minimum 29dB RW, equal or approved.

Figure 12-: Façade Mark Up

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 is proposed as a naturally ventilated system. Based on the information provided to us on the ventilation system, it has been assumed that this system has a maximum of 1 ventilation opening per bedroom. Should the ventilation strategy change to a mechanical ventilation strategy Wave Dynamics should be engaged to provide an appropriate sound insulation performance requirement for any updates to the glazing requirements. 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.

It is recommended that the facade supplier provide laboratory tests confirming the airborne sound insulation performance in the absence of suitable laboratory data a composite sound reduction index calculation undertaken by a suitably qualified acoustic consultant can be used to demonstrate compliance.

The calculations for the glazing specification in Table 12-23 are based on the use of the vents in Table 12-24. The performance value, and that used in the calcs is given in Table 12-24 below.

Façade	Description	Octave Band Centre Frequency (Hz) Sound Reduction Index Dn,e dB					
		125	250	500	1k	2k	4k
BLUE	Acoustic trickle ventilator/Natural Vent ≥ Dn,e,w 37dB	35	32	29	33	41	40
RED	Acoustic trickle ventilator/Natural Vent ≥ Dn,e,w 34dB	33	32	31	37	47	47
All Other Facades	Standard Passive Vent						

Table 12-24: Ventilation specification (in the open position)

12.8.3.3.2 External Wall Construction

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

12.8.3.3.3 Roof Construction

The roof construction has been assumed to achieve a minimum sound insulation performance of 50dB RW. 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 Rw. If there are any skylights to habitable bedrooms Wave Dynamics should be informed to provide specific guidance in each case.

12.8.3.4 Element 3- External Amenity Spaces

The external amenity spaces on the development include private balconies for the maisonettes, gardens for the houses, and large open spaces at the centre and to the east of the development. All rear gardens, all balconies with the exception of the balconies facing Diswellstown road, and public spaces are predicted to achieve the recommended desirable noise levels of 55dBA LAeq,16hour. However alternative amenity spaces have been provided for the residents of these apartments in the form of public open space on the development this is in line with ProPG Guidance.

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 in all of the external amenity spaces will achieve the ProPG recommendations for desirable external amenity noise levels of 50-55dBA LAeq,16hour.

12.8.3.5 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.

12.8.3.6 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 impact on new residential developments as followed in this acoustic design statement.

12.8.3.7 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.

12.8.3.8 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.

12.8.3.9 Acoustic Design v Unintended Adverse Consequences

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

12.8.3.10 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.

12.8.3.11 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 impact on the development and the external amenity spaces. The appropriate provision of external amenity space

has been provided through the use of balconies on suitable elevations, communal amenity spaces on the ground level and rear gardens in line with the ProPG guidance.

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

12.8.4 Operational Phase Vibration

Operational vibration affecting noise sensitive locations has been scoped out as there are no known significant vibration sources associated with the Proposed Development - Plot 2: St. Mochta's LRD.

12.8.4.1 BS4142 Assessment

Operational noise sources outlined in Section 12.7.2.1 illustrate compliance with noise criteria guidance.

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 as outlined in Section 12.7.2.2.1 above.

A BS4142 assessment can be undertaken at detailed design stage if details of any proposed external mechanical plant and equipment is available.

12.8.5 Summary

The following Table 12-25 summarises the identified likely significant effects during the construction phase of the proposed development for Plots 1 and 2 before mitigation measures are applied.

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

Table 12-25: Summary of Construction Phase Likely Significant Effects in the absence of mitigation

The following Table 12-26 summarises the identified likely significant effects for plots 1 and 2 during the operational phase of the proposed development before mitigation measures are applied.

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

Table 12-26: Summary of Operational Phase Likely Significant Effects in the absence of mitigation.

12.9 Mitigation Measures

Mitigation measures outlined below are applicable to both Plot 1 (Luttrellstown Gate Phase 2) and Plot 2 (St. Mochta's LRD).

12.9.1 Construction Stage

12.9.1.1 Noise Mitigation Recommendations

Best practice control measures for noise from construction sites are found within BS 5228 (2009 +A1 2014) part 1. Construction noise impacts are expected to vary during the construction phase of the project, this impact will depend on the distance between the construction activities and noise sensitive receptor. The contractor will ensure that all best practice noise and control methods will be used, to ensure any negative noise impacts at off-site noise sensitive locations are minimised.

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

- selection of quiet plant and equipment;
- noise control at source of the noise;
- screening, and;
- public liaison.

12.9.1.2 General Recommendations

This section of the report sets out noise mitigation options and detailed comment on each one specifically for this site.

12.9.1.2.1 Selection of Plant and Equipment

The noise impact of all plant and equipment should be assessed by an appropriately qualified acoustic consultant prior to selection of the plant for the project. Where an item of plant is identified as noisy with the potential to cause a negative noise impact it should be reviewed to check if there is an alternative quieter version of the same plant to undertake the same construction task.

12.9.1.2.2 Noise Control at Source

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

- All plant and equipment to be switched off when 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.
- Ensure all plant and equipment is well maintained and cleaned, all lubrication should be in line with manufacturers guidelines.

12.9.1.2.3 Screening

Screening when used correctly can be an effective method of reducing the construction noise impact on the NSL's. The use of site hoarding and careful selection of areas for noise 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 provided below:

https://ventac.com/acoustic-products/noisebreak-acoustic-barrier/

https://echobarrier.com/

Figure 12-: Temporary Construction Noise Barrier © Ventac

12.9.1.2.4 Public Engagement

It is recommended that a public liaison officer should be put forward by the contractor to liaise with the local residents on matters relating to noise. Residents should 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 should also be the point of contact for all complaints and be responsible for reviewing the noise monitoring results and exceedances.

12.9.1.2.5 Site Specific Recommendations

Table 12-35 below outlines the recommended site-specific noise mitigation measures based on the attenuation for each construction phase.

Construction Stage	Recommended Noise Mitigation Measures
Site Setup	Erect a minimum 2.4m high site hoarding that blocks the line of sight between noise source and receiver. 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 Local screening using the examples provided in General Recommendations Section 12.8.1.2 are required around hand tools in addition to hoarding.

Construction Stage	Recommended Noise Mitigation Measures
	An absorptive lining should be considered for screening around hand tools will need to have an absorptive lining to avoid reflections increasing noise at other receivers. On this project 8 NSL's have been identified it is recommended that a noise monitor should be placed on the boundary of the nearest noise sensitive locations closest to the works i.e. NSL4 and NSL5 in this case.
Substructure	Site hoarding to block line of sight. Local screening around noisy plant and equipment.
Superstructure	Local screening around saws/hammers where possible. Use external new building to screen noise from works where possible.
External Finishes	Local screening around hand tools.

Table 12.27: Mitigation Required Based on the Construction Noise Predictions

12.9.2 Operational Stage

Based on the results from the noise impact assessment, the predicted results show compliance with all relevant standards for noise impact at the surrounding noise sensitive receptors. Therefore, no mitigation measures are required for the operational phase of the development.

12.9.3 Summary of Post-mitigation Effects

The following Table 12-28 summarises the identified likely significant residual effects during the construction phase of the proposed development following the application of mitigation measures.

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

Table 12-28: Summary of Construction Phase Effects Post Mitigation

The following Table 12-29 summarises the identified likely residual significant effects during the operational phase of the proposed development post mitigation.

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

Table 12-29: Summary of Operational Phase Effects Post Mitigation

12.10 Residual Impact of the Proposed Development

This section assesses potential significant environmental impacts which remain after mitigation measures are implemented.

12.10.1 Proposed Development - Plot 1 (Luttrellstown Gate Phase 2) and Plot 2 (St. Mochta's LRD)

12.10.1.1 Construction Stage

As the construction phase is temporary, there will be no long-term/permanent noise impacts on the surrounding area from construction noise. Section 12.8.1.1 above outlines mitigation measures which if used in full will reduce the construction noise impact on the surrounding sensitive receptors.

12.10.1.2 Operational Stage

Operational noise sources include plant and equipment, external amenity spaces and traffic movements in and out of the site. Based on the noise impact assessment it is not likely that these sources will have a negative noise impact on the surrounding area.

12.11 Cumulative

12.11.1 Cumulative Development

The application sites for Plot 1 (Luttrellstown Gate Phase 2) and Plot 2 (St. Mochta's LRD) form part of a larger landholding in the townlands of Kellystown, Porterstown and Diswellstown, Clonsilla, Dublin 15, which has been subject to a number of recent planning permissions, summarised below. The consented Kellystown SHD scheme ABP-312318-21 was granted (with 27no. conditions) on 2 March 2023, under section 9(4) of the Planning and Development (Housing) and Residential Tenancies Act 2016 for a Strategic Housing Development. The consented scheme includes 346no. dwellings (123no. houses and 3no. apartment buildings accommodating 223no. apartment units)1 , 1no. childcare facility (c. 528 sq m) and 1no. retail unit (c. 236 sq m), in buildings ranging from 2 to 8-storeys, and associated site works and 2.1ha public park amenity. The overall gross site area of the entire consented scheme amounts to c. 9.73 ha, at land zoned 'RS' residential, in Eastern Development Area 1 and land zoned 'OS' open space to the south of permitted Kellystown Link Road. The site is otherwise generally bounded by the existing Kellystown Link Road and schools to the south; the Old Porterstown Road and existing St Mochta's FC grounds to the east; Dr Troy Bridge/L3036 Porterstown Link Road also to the east; the Dublin Maynooth rail line and Grand Canal to the north and undeveloped (Luttrellstown Gate) lands to the west.

Amendments to the consented SHD scheme **ABP-312318-21** was granted on 21 August 2024 under **Reg. Ref. LRD0034-S3** for development comprising of the reconfiguration of Block A, located in the eastern corner of the site, to accommodate 193no. dwellings in total (an increase of 28no. dwellings) in buildings ranging between 2 and 8-storeys in height, with the following residential unit mix: 82no. 1- bed apartment units, 108no. 2-bed apartment units, and 3no. 2-bed duplex units. Associated reconfiguration of internal floor plans to accommodate an increase from 31no. to 34no. apartment units per floor. Reduced floor area of the internal residential amenity area (from c.405.7 sq m to c.120.9 sqm). Reduced floor area of the retail unit (from c.236 sq m to c.200.6 sq m). And all associated and ancillary site development, infrastructural, hard and soft landscaping and boundary treatment works.

A live planning application, currently at Further Information Stage under **FW25A/0033E** seeks the relocation of St. Mochta's Football Club grounds, to 'OS' zoned lands to the south of Kellystown Link Road and north of the Cemetery lands and Luttrellstown Road, within the new emergent residential neighbourhood of Kellystown, Dublin 15. This isin accordance with Key Objective DA 1.1 for the Eastern Development Area of the Kellystown Local Area Plan. In November 2020, Fingal County Council published proposals for the development of a link road through the Kellystown lands for public consultation, under the **Part 8 development process**. Note that the consented Kellystown SHD scheme **ABP-312318-21** includes the extension of the 'Kellystown Link Road' west from its

existing section serving the school campus and cemetery lands. A single new vehicular access point to residential development in the Kellystown Eastern Development Area extends north from the 'Kellystown Link Road', under SHD ABP-312318-21. Upgrade works to the existing segment of the 'Kellystown Link Road' and its junctions with Porterstown Road and Diswellstown Road/Overbridge are also included in the Kellystown SHD permission. In the wider surrounding area, the following developments are subject of live planning permissions:

- **ABP Reg. Ref. 320886-24 (FCC Reg. Ref. LRD0021/S3E)** (north of the Dublin-Maynooth Railway Line) issued with a Grant of Permission on 21 January 2025 for the construction of 170 residential units, a café, and a childcare facility, and all associated development works including the demolition of structures, site clearance, and ground levelling.
- **ABP Reg. Ref. 315707-23 (FCC Reg. Ref. FW22A/0152)** (north of the Dublin-Maynooth Railway Line) issued with a Grant of Permission on 19 December 2023 comprises the construction of a mixed use retail and residential development comprising 1no. food store (2,500sqm GFA), 3 no. retail units (611.8sqm GFA) and 67 no. residential units.2

12.11.2 Cumulative Assessment - Plot 1 (Luttrellstown Gate Phase 2) and Plot 2 (St. Mochta's LRD)

The cumulative residual effects of the overall proposed development (Plot 1: Luttrellstown Gate Phase 2 and Plot 2: St. Mochta's LRD), considering both the construction and operational phases, are primarily related to noise. Construction activities such as demolition and substructure will inevitably introduce noise into the environment. However, recommended mitigation measures outlined in Section 12.9 of this chapter will ensure that construction noise impacts will be imperceptible at NSL's. During the operational phase, a marginal increase in traffic associated with the development is expected to result in a slight rise in ambient noise levels of up to 1dBA at certain NSL's. Operational external amenity area noise levels will not have an impact on NSL's.

Noise impacts are anticipated to be negligible, localised, and compliant with relevant criteria, ensuring that they remain within acceptable levels. No other significant residual effects are expected following the implementation of appropriate mitigation measures during the construction phase.

12.11.2.1 Worst Case Impact

This assessment assumes a worst-case scenario when assessing the construction and operational noise impacts of both Plot 1: Luttrellstown Gate Phase 2 and Plot 2: St. Mochta's LRD), on the surrounding noise sensitive locations. The dominating noise source in the area is road traffic noise, even with the additional traffic from the construction and operational phases the predicted increase is likely less than 1dB(A) at each NSL.

The operational phase of both Plot 1: Luttrellstown Gate Phase 2 and Plot 2: St. Mochta's LRD), will see an increase of traffic volumes on all link roads assessed, however due to the construction of the development, some NSL's will benefit from screening because of the overall proposed development and will in turn be predicted to achieve lower onset noise levels from traffic noise.

12.12 Risk of Major Accidents or Disasters

There is no predicted adverse effects of the project on the environment in terms of acoustics. As outlined the construction phase of the project will pose potential noise nuisance without mitigation measures in place and the operational phase of the project is predicted to comply with relevant standards such as the Dublin Agglomeration Noise Action Plan and EPA NG4.

12.13 Monitoring

12.13.1 Construction Stage

During the construction phase of both Plot 1 (Luttrellstown Gate Phase 2) and Plot 2 (St. Mochta's LRD), construction noise monitoring should be undertaken to ensure compliance with the relevant guidance.

12.14 Difficulties Encountered

The construction programmes for Plot 1 and Plot 2 of the Proposed Development have not been finalised at this stage, construction programmes will only be known once a full site layout has been agreed and finalised, and a contractor has been appointed.

Further predictions and assessment may be required if significant changes in plant and equipment are proposed.