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Proposed Residential Development
Land to the North of Postland Road, Crowland, PE6 0JB

Noise Impact Assessment

For:
Seagate Homes

29th April 2025

Ref: NIA-11796-24-12035-v2 Postland Road, Crowland
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Contents

1 Introduction

1.1 Overview

Environmental Noise Solutions Ltd (ENS) has been commissioned by Seagate Homes to undertake a noise impact assessment for the proposed residential development at land to the north of Postland Road, Crowland, PE6 0JB (hereafter referred to as 'the site').

The objectives of the noise impact assessment were to:

- Determine the ambient noise climate at the site
- Assess the potential impact of the existing noise climate on the consented residential development with reference to the National Planning Policy Framework and other pertinent guidelines
- Provide recommendations for a scheme of sound attenuation works, as necessary, so that the future occupants of the proposed development do not experience any unacceptable loss of amenity due to noise

This report details the methodology and results of the assessment and provides recommendations for the building envelope (fenestration and ventilation) and boundary treatments. It has been prepared to accompany a planning application to be submitted to South Holland District Council.

The report has been prepared for Seagate Homes for the sole purpose described above and no extended duty of care to any third party is implied or offered. Third parties referring to the report should consult Seagate Homes and ENS as to the extent to which the findings may be appropriate for their use.

A glossary of acoustic terms used in the main body of the text is contained in Appendix 1.

1.2 Site Description and Development Proposals

The site is located on open land to the north of Postland Road, in a mixed-use setting on the north-eastern fringe of Crowland, as shown (highlighted in red) in Figure 1.1.

Figure 1.1: Location of proposed residential development

The site is bound by:

- Commercial units to the north
- Postland Road with James Road further to the south
- Former garden centre to the east
- Existing residential to the west

The ambient noise climate at the site is predominantly due to vehicles along Postland Road and James Road.

The commercial units to the north include JJ Premium Cars (car sales) which operate 0900-1800 hours Monday to Friday and 0900-1600 hours on weekends, and Mechanic Man (vehicle repair) which operates Monday to Friday 0800-1800 hours.

It is understood that JJ Premium Cars takes 1 no. delivery per week of new vehicles by means of HGV transporter, during daytime opening hours.

Development proposals are for 9 no. new-build residential dwellings with associated landscaping and access roads. Layout plans indicate that the residential development footprint is set back circa 40 metres from the nearside kerb of Postland Road, and circa 100 metres to James Road.

2 Policy Context and Assessment Guidance

2.1 National Planning Policy Framework

The National Planning Policy Framework (NPPF)[1] was updated in February 2025 and sets out the Government's planning policies for England and how these are expected to be applied.

Where issues of noise impact are concerned the NPPF provides brief guidance in paragraph 187 where it states that planning policies and decisions should contribute to and enhance the natural and local environment by:

'preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of…..noise pollution'.

Paragraph 198 advises that:

'Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should…..mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life'.

With regard to extant community noise sources and the potential to affect proposed new developments, Paragraph 200 states that:

'Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed.'

The NPPF also refers to the 2010 DEFRA publication, the Noise Policy Statement for England (NPSE) which reinforces and supplements the NPPF.

2.2 Noise Policy Statement for England

The Noise Policy Statement for England[2] (NPSE) sets out the long-term vision of promoting good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development. This long-term vision is supported by the following aims:

- Avoid significant adverse impacts on health and quality of life
- Mitigate and minimise adverse impacts on health and quality of life
- Where possible, contribute to the improvement of health and quality of life

1 National Planning Policy Framework. Ministry of Housing, Communities and Local Government (2021)
2 Government Department for Environment, Food and Rural Affairs. Noise Policy Statement for England. March 2010.

The NPSE describes the following levels at which noise impacts may be identified:

- NOEL – No Observed Effect Level. This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise
- LOAEL – Lowest Observed Adverse Effect Level. This is the level above which adverse effects on health and quality of life can be detected
- SOAEL – Significant Observed Adverse Effect Level. This is the level above which significant adverse effects on health and quality of life occur

According to the explanatory notes in the statement, where a noise level falls between the lowest observable adverse effect level (LOAEL) and a level which represents a significant observable adverse effect level (SOAEL):

'….all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life whilst also taking into consideration the guiding principles of sustainable development. This does not mean that such effects cannot occur.'

2.3 Planning Practice Guidance on Noise

Planning Practice Guidance[3] (PPG) is an online resource which provides additional guidance and elaboration on the NPPF. It advises that the Local Planning Authority should consider the acoustic environment in relation to:

- Whether or not a significant adverse effect is occurring or likely to occur
- Whether or not an adverse effect is occurring or likely to occur
- Whether or not a good standard of amenity can be achieved

In line with the Explanatory Note of the NPSE, the PPG references the LOAEL and SOAEL in relation to noise impact. It also provides examples of outcomes that could be expected for a given perception level of noise, plus actions that may be required to bring about a desired outcome. However, in line with the NPSE, no objective noise levels are provided for LOAEL or SOAEL.

The PPG also provides general advice on the typical options available for mitigating noise, suggesting that Local Plans may include noise standards applicable to proposed developments within the Local Authority's administrative boundary, although it states that:

'Care should be taken, however, to avoid these being implemented as fixed thresholds as specific circumstances may justify some variation being allowed'.

The subjective nature of noise means that there is not a simple relationship between noise levels and the impact on those affected. This will depend on how various factors combine in any particular situation. The following guidance documents provide some meaningful context.

2.4 ProPG Planning and Noise: New Residential Development

ProPG Planning and Noise: New Residential Development (ProPG)[4] was published in 2017 by the Association of Noise Consultants, Institute of Acoustics and the Chartered Institute of Environmental Health.

3 Planning Practice Guidance on Noise: http://planningguidance.planningportal.gov.uk/blog/guidance/noise/

4 'ProPG Planning and Noise: New Residential Development (ProPG)', 2017. Association of Noise Consultants (ANC), Institute of Acoustics (IOA) and the Chartered Institute of Environmental Health (CIEH)

Stage 2: Element 2 of ProPG sets indoor ambient noise levels for residential dwellings based on the guidance contained in British Standard 8233:2014 'Guidance on Sound Insulation and Noise Reduction for Buildings' (BS 8233), see Table 2.1.

Table 2.1: Indoor Ambient Noise Levels in Dwellings

Activity	Location	Indoor Ambient Noise Levels	
Resting	Living Room	35 dB $L_{Aeq\ (0700\text{-}2300)}$	-
Dining	Dining Room/Area	40 dB $L_{Aeq\ (0700\text{-}2300)}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq\ (0700\text{-}2300)}$	30 dB $L_{Aeq\ (2300\text{-}0700)}$ 45 dB $L_{Amax,F\ (2300\text{-}0700)}$

Note 4 to the above table states:

'A guideline value may be set in terms of SEL or $L_{Amax,F}$, 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 $L_{Amax,F}$ more than 10 times a night.'

Note 5 to the above table states:

'Where it is not possible to meet internal target levels with windows open, internal noise levels can be assessed with windows closed, however any façade openings used to provide whole dwelling ventilation (e.g. trickle ventilators) should be assessed in the "open" position and, in this scenario, the internal L_{Aeq} target levels should not normally be exceeded, subject to the further advice in Note 7'.

This is consistent with the guidance contained within the PPG, which states that:

'... consideration should also be given to whether adverse internal effects can be completely removed by closing windows and, in the case of new residential development, if the proposed mitigation relies on windows being kept closed most of the time. In both cases a suitable alternative means of ventilation is likely to be necessary. Further information on ventilation can be found in the Building Regulations'.

On the basis of the above, the following criteria (with windows closed and an alternative means of ventilation provided) are considered appropriate for the proposed development and considered to represent good resting and sleeping conditions:

- ≤ 35 dB $L_{Aeq\ (0700\text{-}2300)}$ in habitable rooms during the daytime
- ≤ 30 dB $L_{Aeq\ (2300\text{-}0700)}$ in bedrooms during the night-time
- 45 dB L_{AFMax} not regularly exceeded in bedrooms during the night-time

With regard to external amenity, ProPG reflects the advice given in BS 8233 as follows:

'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 $L_{Aeq,16hr}$.'

'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.'

2.5 Approved Document O

Approved Document O, 2021 is written in support of Part O of Schedule 1 to the Building Regulations 2010. The approved document details methods of addressing overheating of residential dwellings and is applicable only across England.

The approved document has the following relevant guidance in Section 3 regarding noise ingress into buildings:

'In locations where external noise may be an issue (for example, where the local planning authority considered external noise to be an issue at the planning stage), the overheating mitigation strategy should take account of the likelihood that windows will be closed during sleeping hours (11pm to 7am).

Windows are likely to be closed during sleeping hours if noise within bedrooms exceeds the following limits.

- *40dB $L_{Aeq,T}$, averaged over 8 hours (between 11pm and 7am)*
- *55dB L_{Amax}, more than 10 times a night (between 11pm and 7am)'*

3 Noise Survey

3.1 Overview

In order to determine the level of external noise affecting the proposed development, noise monitoring was carried out on Wednesday 20th November through to Thursday 21st November 2024.

The adopted noise monitoring positions (shown in Appendix 2) were as follows:

- MP1 was located at the southern boundary of the site, at circa 40 metres from Postland Road
- MP2 was located at the northern boundary of the site, overlooking JJ Premium Cars

Noise measurements were undertaken in free field conditions at 4 metres above ground level using Bruel & Kjaer 2250 and NTi XL3 Type 1 integrating sound level meters. Each meter was connected to a windshield covered microphone positioned at the locations detailed above.

The measurement system calibration was verified immediately before and after the survey period using a Bruel & Kjaer Type 4231 calibrator. No drift in calibration levels greater than 0.5 dB was noted.

Measurements consisted of A–weighted broadband parameters including L_{Aeq}, L_{A10} L_{A90}, and L_{AFmax} octave band data.

The noted weather conditions during the surveys were dry with wind speeds < 5 m/s. Weather conditions were therefore considered appropriate for noise monitoring.

3.2 Summary

Table 3.1 presents a summary of the noise data for each measurement session, at each measurement position, rounded to the nearest decibel.

Table 3.1: Summary of Noise Measurement Data

Position	Date	Time	L_{Aeq} (dB)	L_{A90} (dB)	L_{A10} (dB)	L_{AFMax} (dB)	Comment
MP1	20/11/2024	1145–2300	51	41	55	-	Road traffic on Postland Road and James Road
	20-21/11/24	2300–0700	45	35	49	61	
MP2	20/11/2024	1302–1402	54	52	57	-	Transporter delivery to JJ Premium Cars (idling HGV engine and vehicle movements)
		1402–1502	51	46	54	-	Distant road traffic on Postland Road and James Road, occasional vehicle movements and impacts at JJ Premium Cars audible but not significant
		1502–1602	49	43	52	-	

3.3 Analysis

Noise levels at the southern boundary (MP1) were due to road traffic on Postland Road and James Road.

Daytime and night-time noise levels at MP1 were measured at **51 dB $L_{Aeq\ (0700\text{-}2300)}$** and **45 dB $L_{Aeq\ (2300\text{-}0700)}$** respectively. Typical (11th highest) maximum noise levels at MP1 were measured at up to **61 dB L_{AFMax}** during the night-time.

Noise levels at the northern boundary were predominantly due to distant road traffic, with occasional noise from yard activity at JJ Premier Cars, including a vehicle delivery via HGV transporter.

In instances where commercial noise (in this case delivery noise) is present but not significant, ProPG advises as follows:

'Professional judgement will have to be exercised in addressing these sorts of issues. One possible approach may be to apply BS4142:2014 character corrections to the noise level guideline values in order to derive suitable effect thresholds and/or mitigation design targets and to use the same reference time periods recommended in the standard.'

In accordance with BS 4142:2014+A1-2019 'Methods for Rating and Assessing Industrial and Commercial Sound' (BS 4142)[5], the reference time interval of the specific sound is 1 hour during the daytime.

The worst-case 1-hour ambient noise level measured at MP2 was **54 dB $L_{Aeq\ (1\ hour)}$** and encapsulated distant road traffic as well as a transporter delivery to JJ Premier Cars.

The character correction relates to whether and to what degree the specific sound is assessed to have an element of tonality, impulsivity and/or characteristics that are readily distinctive against the residual acoustic environment.

Whilst noise from the delivery was primarily due to HGV engine noise with no specific character, a **+6 dB** penalty for potential impulsivity associated with the unloading is robustly applied.

It is considered that applying this correction to worst-case short-term noise levels measured at MP2 (note: these measurements include distant traffic as well as delivery noise), whilst assessing the development to BS 8233 internal criteria, represents a robust assessment methodology.

5 British Standard 4142:2014+A1-2019 Methods for rating and assessing industrial and commercial sound, BSI (2014)

4 Noise Assessment

4.1 Design Noise Levels

Design noise levels at the southern boundary of the site are as follows:

- **≤ 51 dB $L_{Aeq\ (0700\text{-}2300)}$** during the daytime
- **≤ 45 dB $L_{Aeq\ (2300\text{-}0700)}$** during the night-time
- **≤ 61 dB L_{AFMax}** during the night-time

Allowing for a robust +6 dB impulsivity penalty, the worst-case daytime noise level at the northern boundary of the site is taken as **60 dB $L_{Aeq\ (1\ hour)}$.**

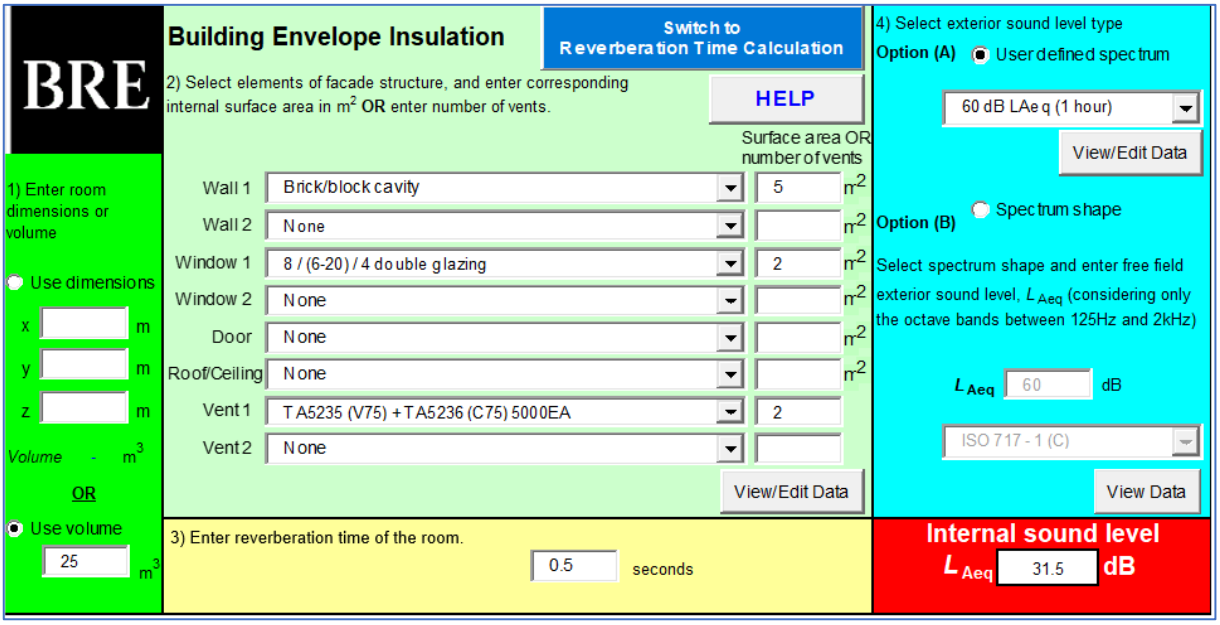
4.2 Scheme of Sound Attenuation

In order to calculate the sound insulation requirements of the building envelope for habitable rooms throughout the development, the Building Research Establishment (BRE) building envelope insulation calculation spreadsheet was used. This spreadsheet is based on the calculation methodology advocated in BS 8233. The spreadsheet allows input of external noise levels, typical room dimensions and reverberation time together with parameters for the various elements of the building envelope and calculates the internal noise level in terms of the external noise level metric (L_{Aeq} and L_{AFMax} in this case).

Habitable rooms of Plot 5 which face towards JJ Premium Cars should be provided with enhanced glazing rated at least **32 dB R_w+C**, such as 8 mm glass / 6-20 mm cavity / 4 mm glass, in conjunction with acoustic trickle vents rated at least **38 dB $D_{n,e,w}$+C**, such as the Titon V75 vent (TA5235) with C75 canopy (TA5236) or equivalent.

As evidenced in the calculation sheet below, this configuration will provide circa 28 dB(A) sound insulation from external to internal at the site.

Figure 4.1: Example BRE Calculation Spreadsheet



Habitable rooms of Plot 5 which face away from JJ Premium Cars may be provided with standard double glazing rated at least **25 dB R_w+C_{tr}** in conjunction with standard trickle vents or wall vents.

Standard thermal glazing and standard trickle vents are also appropriate for remaining habitable rooms throughout the site, which are set back from JJ Premium Cars.

Based on measurements taken at numerous sites, a typical thermal double-glazed window with standard trickle vents provides circa 25 dB(A) sound insulation from external to internal.

The resultant internal noise levels are set out in the table below.

Table 4.1 – External Noise Levels and Resultant Internal Noise Levels

Location	External Noise Level	Reduction	Resultant Internal Level
Habitable rooms adjacent to and fronting towards JJ Premium Cars	≤ 60 dB $L_{Aeq\ (1\ hour)}$	–28 dB	≤ 32 dB $L_{Aeq\ (1\ hour)}$
Remaining habitable rooms	≤ 51 dB $L_{Aeq\ (0700\text{-}2300)}$ ≤ 45 dB $L_{Aeq\ (2300\text{-}0700)}$ ≤ 61 dB L_{AFMax}	–25 dB	≤ 26 dB $L_{Aeq\ (0700\text{-}2300)}$ ≤ 20 dB $L_{Aeq\ (2300\text{-}0700)}$ ≤ 36 dB L_{AFMax}

Appendix 3 contains an annotated glazing/ventilation markup plan. For brevity, plots requiring standard glazing/ventilation are not marked.

The ceilings (and side cheeks to the dormer windows) in any room-in-roof bedrooms requiring enhanced glazing should be double boarded, with 100 mm (minimum) mineral wool insulation above. The glazing requirements are also applicable to 'Velux' windows.

The following points should be noted:

- The glazing recommendations apply to the window within a sealed unit. It is the responsibility of the window supplier to ensure that the window frame does not compromise the performance of the glazing.
- When selecting a glazing system to satisfy the requirements outlined above, it is important to ensure that the R_w+C value is achieved (rather than simply the R_w value). Published R_w values tend to be higher than corresponding R_w+C values; therefore, incorrect selection could result in an overestimation of sound reduction performance which in turn could result in higher internal noise levels.
- The opening and free area of the ventilation units should be checked by a mechanical service engineer before designs are finalised. Should the equivalent open area be insufficient to meet the minimum requirements of ADF, it may be necessary to increase the number of units per habitable room. Where this applies, the required sound reduction of the ventilation units may need to be increased accordingly

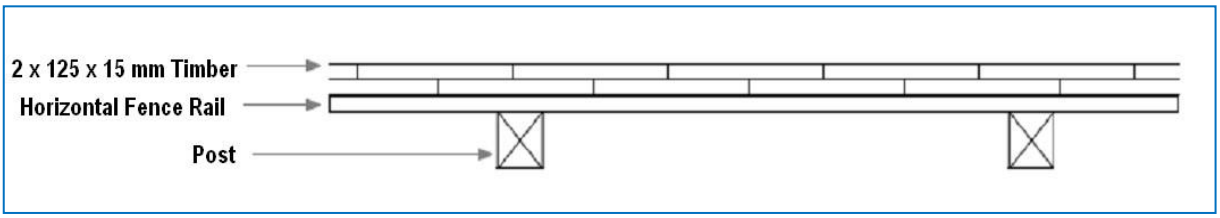
4.3 External Amenity

As a precaution against potential noise from JJ Premium Cars, it is recommended that the gardens of Plots 5 and 6 at the northern boundary are provided with circa 2-metre-high solid timber fences or brick walls (see Appendix 3 for barrier locations).

A brick wall of any construction is appropriate, providing there are no gaps in the construction.

If a solid timber fence is installed, then it should be ensured that it has a mass per unit area of ≥ 10 kg/m^2. The fence should have no gaps or holes and should be fully sealed at the ground (i.e. include a gravel board).

An indicative acoustic fence detail is illustrated below. The double-thickness solid timber construction is considered robust and appropriate.



5 Mitigation of Overheating

ADO states that for moderate risk locations (i.e. outside of London) the minimum free area of the open window should be at least 4% of the floor area of the room.

As the open area varies as a function of the floor area, for a typical floor-to-ceiling height of 2.4m, a free area of 4% of the floor area equates to an external to internal noise reduction of 10 dB.

With reference to the internal targets contained in ADO, it is assumed that open windows can form the overheating mitigation strategy with no additional ventilation or cooling, providing the external noise levels outside bedrooms at night do not exceed **50 dB $L_{Aeq\ (2300\text{-}0700)}$** and **65 dB L_{AFMax}** (more than 10 times).

Night-time noise levels at the site were measured at **45 dB $L_{Aeq\ (2300\text{-}0700)}$** and **61 dB L_{AFMax}**, meaning that bedroom windows throughout the site may be opened to the minimum open area of 5% of the floor area. On this basis, the overheating mitigation strategy at the site is not constrained by acoustics.

6 Summary and Conclusions

A noise impact assessment has been performed for the proposed residential development at land to the north of Postland Road, Crowland, PE6 0JB.

Noise monitoring was carried out on Wednesday 20th through to Thursday 21st November 2024, to determine the level of external noise affecting the proposed development.

Section 4 provides recommendations for a noise mitigation strategy, to protect potential future residential development at the site from the existing noise climate using relevant guidance including BS8233 / ProPG.

Appendix 1 – Abbreviations and Definitions

Sound Pressure Level (L_p)
The basic unit of sound measurement is the sound pressure level. As the pressures to which the human ear responds can range from 20 μPa to 200 Pa, a linear measurement of sound levels would involve many orders of magnitude. Consequently, the pressures are converted to a logarithmic scale and expressed in decibels (dB) as follows:

$L_p = 20 \log_{10}(p/p_o)$

Where L_p = sound pressure level in dB; p = rms sound pressure in Pa; and p_o = reference sound pressure (20 μPa).

A-weighting
A frequency filtering system in a sound level meter, which approximates under defined conditions the frequency response of the human ear. The A-weighted sound pressure level, expressed in dB(A), has been shown to correlate well with subjective response to noise.

Equivalent continuous A-weighted sound pressure level, $L_{Aeq, T}$
The value of the A-weighted sound pressure level in decibels of continuous steady sound that within a specified time interval, T, has the same mean-square sound pressure as a sound that varies with time. $L_{Aeq, 16h}$ (07:00 to 23:00 hours) and $L_{Aeq, 8h}$ (23:00 to 07:00 hours) are used to qualify daytime and night time noise levels.

$L_{A10, T}$
The A-weighted sound pressure level in decibels exceeded for 10% of the measurement period, T. $L_{A10, 18h}$ is the arithmetic mean of the 18 hourly values from 06:00 to 24:00 hours.

$L_{A90, T}$
The A-weighted sound pressure level of the residual noise in decibels exceeded 90% of a given time interval, T. L_{A90} is typically taken as representative of background noise.

$L_{AF\ max}$
The maximum A-weighted noise level recorded during the measurement period. The subscript 'F' denotes fast time weighting, slow time weighting 'S' is also used.

Single Event Level / Sound Exposure Level (SEL or L_{AE})
The energy produced by a discrete noise event averaged over one second, regardless of the event duration. This allows for comparison between different noise events which occur over different lengths of time.

Weighted Sound Reduction Index (R_W)
Single number quantity which characterises the airborne sound insulation properties of a material or building element over a defined range of frequencies (R_W is used to characterise the insulation of a material or product that has been measured in a laboratory).

Appendix 2 – Proposed Site Layout and Noise Measurement Positions

Appendix 3 – Scheme of Sound Attenuation