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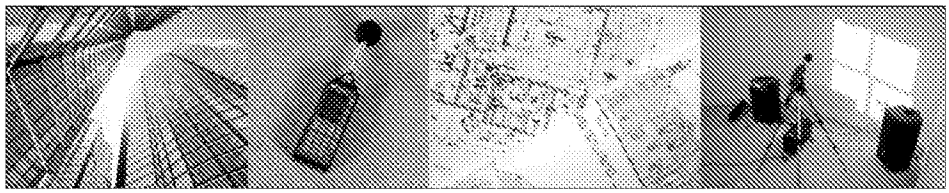

OLDLANDS FARM
BOGNOR REGIS
WEST SUSSEX
PO22 9NN

ENVIRONMENTAL NOISE IMPACT ASSESSMENT

v.5

Client:
HANBURY PROPERTIES
17 Northgate
Chichester
West Sussex
PO19 1BJ

9th October 2024
Ref: M5350

CONTENTS

Project Reference	M5350
Issue No.	5
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1. SUMMARY

1.1 An assessment of environmental noise has been carried out at Oldlands Farm, Bognor Regis, West Sussex, PO22 9NN, where new B2/B8 industrial buildings are proposed. The objective of the exercise is to confirm that noise levels associated with the operation of buildings will not have a detrimental effect on the nearest noise sensitive buildings.

1.2 The existing ambient noise climate around the vicinity of the application site has been established (Section 3).

1.3 Section 4 provides a description of the relevant national planning policies and defines the criteria which would commonly be applied to development projects of this nature.

1.4 An assessment of the predicted noise levels for the three main noise sources; activity noise externally, break-out noise from the building and building services plant noise has been provided (Section 5). Mindful that specific operators of the buildings have yet to be confirmed, the predictions are based on worst reasonable case assumptions regarding its use, day and night.

1.5 The predicted noise levels have been assessed against the design criteria set out in Section 3.2 of the Planning Noise Advice Document; Sussex dated November 2023 which states,

> *'The rating level of the industrial or commercial sound source should, where practicable, achieve a level no greater than the representative background sound, when measured in accordance with BS 4142:2014 + A1: 2019.'*

1.6 Table 1.1 confirms the overall predictions, alongside the design limit derived from this policy:

PREDICTED FAÇADE NOISE LEVELS, dB(A)		
Noise Source	**Daytime $L_{Aeq,1hr}$**	**Night-time $L_{Aeq,15mins}$**
Noise from HGV activities	30	28
Noise from Forklift Trucks	29	29
Break-out Noise from Building	24	24
Noise from Building Services Plant	40	29
Overall Combined Noise Level	41	34
Rating Level (incl +3dB Character Correction)	44	37
Assessed Existing Background Level L_{A90}	48	37

Table 1.1 – Summary Assessment of Predicted Noise

1.7 It is therefore concluded that noise from activities associated with the development will have negligible impact on the neighbouring occupiers.

2. INTRODUCTION

2.1 An assessment of environmental noise has been undertaken at Phase 3, Oldlands Farm, Bognor Regis, PO22 9NN, on behalf of Hanbury Properties.

2.2 The proposal site is located to the east of the A29 Shripney Road. The nearest permanent residential buildings are some 160m[1] away at Oldlands Farm Cottages to the east (see Figure 1 – Site Location).

2.3 Permission was granted in October 2023 for an outline planning application (BE/150/22/OUT) which described the demolition of existing derelict building and the erection of up to 18,580sqm of new industrial/warehouse (Use Class B2/B8) and ancillary offices (Use Class E (g)) floorspace. That application was accompanied by a Noise Impact Assessment report, by Ian Sharland Limited, demonstrating how the acoustic amenity of local residents could be protected.

2.4 The design of the scheme has since been developed from the details submitted with the outline application. Whilst maintaining the overall size of the project, the number of buildings on site has increased from two to three, with the additional warehouse being located in the south-east corner of the site (see Figure 2).

2.5 Noting that the original planning consent did not contain any conditions explicitly relating to the control of operational noise, it is appropriate to provide a revised Noise Impact Assessment to demonstrate that residential amenity will continue to be protected under the currently proposed scheme.

2.6 Ian Sharland Limited has been instructed to provide detailed clarification of the council's concerns. The formal objectives of the exercise may therefore be summarised as follows:

(i) To determine the existing ambient noise climate in the vicinity of the site,
(ii) To propose a design criterion for limiting noise emissions from the site,
(iii) Prediction of noise generated due to activities associated with the building,
(iv) Assessment of the predicted noise levels against the design criteria.

2.7 This report details the investigations carried out in respect of each of these objectives and summarises the conclusions which have been reached.

[1] These distances are taken from halfway along the north façade of the proposed new building to the nearest property of the named street.

3. SURVEY OF EXISTING NOISE LEVELS

3.1 The first step in this assessment is to measure and describe the existing ambient noise levels.

3.2 A noise survey was undertaken from Friday 18th until Tuesday 22nd November 2022.

3.3 A Rion NL-52 Type 1 sound level meter was set up within the footprint of a derelict warehouse approximately 40m from Oldlands Farm Cottages (see Figure 3 – Monitoring Location).

3.4 The microphone was attached to an extendable light stand and set up at a height of approximately 2.5m above the ground in a free field position.

3.5 The equipment was configured to measure 5minute samples of the following acoustic parameters:

L_{Aeq} The A-weighted equivalent continuous sound pressure level which, over the sample period, contains the same acoustic energy as the time-varying signal being recorded.

L_{Amax} The A-weighted maximum sound pressure level recorded during each sample period (as measured on fast response).

L_{A90} A statistical parameter, representing the A-weighted noise level exceeded for 90% of each sample period. This gives a measure of the underlying noise and is commonly used to describe the ambient background noise.

3.6 The sound level meter was calibrated before and after the survey and showed no significant variance. Details of the equipment used are shown in Table 3.1.

Type	Manufacturer	Description	Serial number	Last Calibration Date	Calibration Certificate No:
NL-52	Rion	Sound Level Meter	142660	15.04.21	2021-0406
1251	Norsonic	Calibrator	32602	15.04.21	2021-0409

Table 3.1 – Meter Calibration

3.7 Weather conditions throughout the survey period have been supplied by weatheronline.co.uk and are summarized within Table 3.2.

Date	Average Temperature (°C)	Rainfall (mm)	Average Wind Speed m/sec	Wind Direction
Friday 18/11	9	0.0	5.5 / 7.9	W
Saturday 19/11	9	1.0	1.3 / 3.6	W
Sunday 20/11	10	4.0	5.5 / 7.9	W
Monday 21/11	9	10.0	8.0 / 10.7	SE
Tuesday 22/11	9	5.0	3.4 / 5.4	SW

Table 3.2 – Weather Conditions during survey.

3.8 Figure 4 shows the variation in ambient noise levels during the survey period, and the Table 3.3 confirms the measured levels during each of the hourly periods.

Period		Daytime $L_{Aeq,\ 07.00 - 23.00}$	Night-Time $L_{Aeq,\ 23.00 - 07.00}$	Night-time $L_{Amax,\ fast}$
Friday 18/11	dB(A)	54.8*	47.1	67
Saturday 19/11	dB(A)	54.2	46.0	68
Sunday 20/11	dB(A)	54.3	47.5	72
Monday 21/11	dB(A)	56.0	51.7	68
Tuesday 22/11	dB(A)	55.8*	-	-

**Part measurements*

Table 3.3 – Summary of Measurements

3.9 The L_{Amax} levels shown in the table are the peak values based on the 90th percentile and may exclude exceptional 'one-off' events that may have occurred.

3.10 Table 3.4 provides a statistical analysis of the measured background noise levels across each day of the survey, offering values for the mean, modal, median and 90th percentile.

Day	Period	Mean	Modal	Median	90th Percentile
Friday 18/11	Day	52	54	53	48
	Night	41	37	40	36
Saturday 19/11	Day	51	53	52	47
	Night	41	37	40	37
Sunday 20/11	Day	51	54	52	47
	Night	42	37	41	37
Monday 21/11	Day	52	56	52	48
	Night	44	37	43	37
Tuesday 22/11	Day	54	53	53	52
	Night	n/a	n/a	n/a	n/a

Table 3.4 – Summary of Background Noise Levels

3.11 With due consideration for the aim of obtaining the representative background noise, this project will adopt the following background noise levels:

Daytime 0700 – 2300	**48 dB(A) L_{A90}**
Nigh Time 2300 – 0700	**37 dB(A) L_{A90}**

4. ASSESSMENT OF NOISE LEVELS

4.1 National Planning Policy Framework (December 2023)

4.1.1 The National Planning Policy Framework (NPPF) sets out the Government's planning policies for England and how these should be applied. It provides a framework within which locally prepared plans for housing and other development can be produced.

4.1.2 Planning law requires that applications for planning permission be determined in accordance with the development plan, unless material considerations indicate otherwise. The National Planning Policy Framework must be considered in preparing the development plan and is a material consideration in planning decisions. Planning policies and decisions must also reflect relevant international obligations and statutory requirements.

4.1.3 The purpose of the planning system is to contribute to the achievement of sustainable development. At a very high level, the objective of sustainable development can be summarised as meeting the needs of the present without compromising the ability of future generations to meet their own needs.

4.1.4 Paragraphs 180, 191 & 193 of the NPPF states:

> ***180.*** *Planning policies and decisions should contribute to and enhance the natural and local environment by:*
>
> *(a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);*
>
> *(b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;*
>
> *(c) maintaining the character of the undeveloped coast, while improving public access to it where appropriate;*
>
> *(d) minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;*
>
> *(e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and*
>
> *(f) remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.*

191. *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:*

a) mitigate and reduce to 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[1] ;

b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason; and

c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes, and nature conservation.

193. *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.*

4.2 National Policy Statement for England (March 2010)

4.2.1 The document "Noise Policy Statement for England" sets out the following vision for on-going noise policy:

"Promote good health and quality of life through the effective management of noise within the context of Government policy on sustainable development."

4.2.2 This vision should be achieved through the following Noise Policy Aims:

"Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- *avoid significant adverse impacts on health and quality of life.*
- *mitigate and minimise adverse impacts on health and quality of life.*
- *and where possible, contribute to the improvement of health and quality of life".*

3.2.3 To achieve these objectives the Noise Policy Statement sets out three noise levels to be defined by the assessor:

[1] Refers here to the NPSE, discussed in Section 3.2 of this report.

- **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. Where levels lie between the LOAEL and SOAEL, the Statement requires that all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also taking into account the guiding principles of sustainable development, as set out in the NPPF.

- **SOAEL** - Significant Observed Adverse Effect Level
  This is the level above which significant adverse effects on health and quality of life occur. It notes, however, that "it is not possible to have a single objective noise-based measure that describes SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times".

4.2.4 Paragraph 2.7 states that "... the application of the NPSE should enable noise to be considered alongside other relevant issues and not to be considered in isolation. In the past, the wider benefits of a policy, development or other activity may not have been given adequate weight when assessing the noise implications".

4.2.5 This provides clear guidance that noise must not be considered in isolation but as part of the overall scheme, taking into account the overall sustainability and associated impacts of the proposed development; there is no benefit in reducing noise to an excessively low level if this creates or increases some other adverse impact. Similarly, it may be appropriate in some cases for noise to have an adverse impact if this is outweighed by the reduction or removal of some other adverse impact that is of greater significance to the development.

4.2.6 The Noise Policy Statement considers that noise levels above the SOAEL would be seen to have, by definition, significant adverse effects and would be considered unacceptable. Where the assessed noise levels fall between the LOAEL and the SOAEL noise levels, the Policy Statement requires that:

> *"all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also considering the guiding principles of sustainable development.... This does not mean that such adverse effects cannot occur."*

4.2.7 Where noise levels are below the LOAEL it is considered there will be no adverse effect. Once noise levels are below the NOEL there will be no observable change. An indication of the numerical definition of LOAEL may be derived from the following guidance.

4.3 Planning Practice Guide 'Noise' (July 2019)

4.3.1 The Ministry of Housing Communities and Local Government provided further guidance to support the NPPF. The section, Noise, published in July 2019, provides the following advice:

When is noise relevant to planning?

Noise needs to be considered when development may create additional noise, or would be sensitive to the prevailing acoustic environment (including any anticipated changes to that environment from activities that are permitted but not yet commenced). When preparing plans, or taking decisions about new development, there may also be opportunities to make improvements to the acoustic environment. Good acoustic design needs to be considered early in the planning process to ensure that the most appropriate and cost-effective solutions are identified from the outset.

What are the observed effect levels?

- *Significant observed adverse effect level: This is the level of noise exposure above which significant adverse effects on health and quality of life occur.*
- *Lowest observed adverse effect level: this is the level of noise exposure above which adverse effects on health and quality of life can be detected.*
- *No observed effect level: this is the level of noise exposure below which no effect at all on health or quality of life can be detected.*

Although the word 'level' is used here, this does not mean that the effects can only be defined in terms of a single value of noise exposure. In some circumstances adverse effects are defined in terms of a combination of more than one factor such as noise exposure, the number of occurrences of the noise in a given time period, the duration of the noise and the time of day the noise occurs.

How can it be established whether noise is likely to be a concern?

At the lowest extreme, when noise is not perceived to be present, there is by definition no effect. As the noise exposure increases, it will cross the 'no observed effect' level. However, the noise has no adverse effect so long as the exposure does not cause any change in behaviour, attitude or other physiological responses of those affected by it. The noise may slightly affect the acoustic character of an area but not to the extent there is a change in quality of life. If the noise exposure is at this level no specific measures are required to manage the acoustic environment.

As the exposure increases further, it crosses the 'lowest observed adverse effect' level boundary above which the noise starts to cause small changes in behaviour and attitude, for example, having to turn up the volume on the television or needing to speak more loudly to be heard. The noise therefore starts to have an adverse effect and consideration needs to be given to mitigating and minimising those effects (taking account of the economic and social benefits being derived from the activity causing the noise).

Increasing noise exposure will at some point cause the 'significant observed adverse effect' level boundary to be crossed. Above this level the noise causes a material change

in behaviour such as keeping windows closed for most of the time or avoiding certain activities during periods when the noise is present. If the exposure is predicted to be above this level the planning process should be used to avoid this effect occurring, for example through the choice of sites at the plan-making stage, or by use of appropriate mitigation such as by altering the design and layout. While such decisions must be made taking account of the economic and social benefit of the activity causing or affected by the noise, it is undesirable for such exposure to be caused.

At the highest extreme, noise exposure would cause extensive and sustained adverse changes in behaviour and / or health without an ability to mitigate the effect of the noise. The impacts on health and quality of life are such that regardless of the benefits of the activity causing the noise, this situation should be avoided.

4.3.2 The table below summarises the noise exposure hierarchy, based on the likely average response:

Perception	***Examples of Outcomes***	***Increasing Effect Level***	***Action***
	No Observed Effect Level		
Not Present	*No Effect*	*No Observed Effect*	*No specific measures required*
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.	*No Observed Adverse Effect*	*No specific measures required*
	Lowest Observed Adverse Effect Level		
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.	*Observed Adverse Effect*	*Mitigate and reduce to a minimum*
	Significant Observed Adverse Effect Level		
Present and disruptive	The noise causes a material change in behaviour, attitude or other physiological response, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area	*Significant Observed Adverse Effect*	*Avoid*
Present and very disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	*Unacceptable Adverse Effect*	*Prevent*

Table 4.1 – Noise Exposure Hierarchy

4.3.3 The guidance further advises:

What factors influence whether noise could be a concern?

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.

These factors include:

- the source and absolute level of the noise together with the time of day it occurs. Some types and level of noise will cause a greater adverse effect at night than if they occurred during the day – this is because people tend to be more sensitive to noise at night as they are trying to sleep. The adverse effect can also be greater simply because there is less background noise at night.
- for a new noise making source, how the noise from it relates to the existing sound environment.
- for non-continuous sources of noise, the number of noise events, and the frequency and pattern of occurrence of the noise.
- the spectral content of the noise (i.e. whether or not the noise contains particular high or low frequency content) and the general character of the noise (i.e. whether or not the noise contains particular tonal characteristics or other particular features), and
- the local arrangement of buildings, surfaces and green infrastructure, and the extent to which it reflects or absorbs noise.

More specific factors to consider when relevant include:

- the cumulative impacts of more than one source of noise.
- whether any 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 (and the effect this may have on living conditions). 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;
- In cases where existing noise sensitive locations already experience high noise levels, a development that is expected to cause even a small increase in the overall noise level may result in a significant adverse effect occurring even though little to no change in behaviour would be likely to occur.
- Noise Action Plans (where these exist), and, in particular the Important Areas identified through the process associated with the Environmental Noise Directive and corresponding regulations should be taken into account. Defra's website has information on Noise Action Plans and Important Areas. Local authority environmental health departments will also be able to provide information about Important Areas.
- the effect of noise on wildlife. Noise can adversely affect wildlife and ecosystems. Particular consideration needs to be given to the potential effects of noisy

development on international, national and locally designated sites of importance for biodiversity.

- where external amenity spaces are an intrinsic part of the overall design, the acoustic environment of those spaces should be considered so that they can be enjoyed as intended.
- some commercial developments including restaurants, hot food takeaways, night clubs and public houses can have particular impacts, not least because activities are often at their peak in the evening and late at night. Local planning authorities will wish to bear in mind not only the noise that is generated within the premises but also the noise that may be made by customers in the vicinity.

  When proposed developments could include activities that would be covered by the licensing regime, local planning authorities will need to consider whether the potential for adverse noise impacts will be addressed through licensing controls (including licence conditions). Local planning authorities should not however presume that licence conditions will provide for noise management in all instances and should liaise with the licensing authority.

Are there further considerations relating to mitigating the impact of noise on residential developments?

Noise impacts may be partially offset if residents have access to one or more of:

- a relatively quiet facade (containing windows to habitable rooms) as part of their dwelling.
- a relatively quiet external amenity space for their sole use, (e.g. a garden or balcony). Although the existence of a garden or balcony is generally desirable, the intended benefits will be reduced if this area is exposed to noise levels that result in significant adverse effects.
- 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, external publically accessible 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-minute walking distance).

4.3.4 The noise impact on residential developments may be partially off-set if the residents of those dwellings have access to:

- *a relatively quiet facade (containing windows to habitable rooms) as part of their dwelling, and/or;*
- *a relatively quiet external amenity space for their sole use, (e.g. a garden or balcony). Although the existence of a garden or balcony is generally desirable, the intended benefits will be reduced with increasing noise exposure and could be such that significant adverse effects occur, and/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, external publically accessible 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 minute walking distance).*

4.4 BS8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings

4.4.1 There is much guidance on the levels of intrusive noise which would be considered acceptable within residential accommodation such as this. Typical advice is found in British Standard 8233:2014 "Guidance on Sound Insulation and Noise Reduction for buildings". Following similar guidance in the 1999 World Health Organisation report "Guidelines for Community Noise", the Standard sets out the following limits for indoor ambient noise levels within living rooms and bedrooms of residential accommodation. This suggests:

Activity	Location	0700 - 2300	2300 - 0700
Resting	Living Room	35 dB(A) LAeq, 16 hr	-
Dining	Dining room/Area	40 dB(A) LAeq, 16 hr	-
Sleeping	Bedroom	35 dB(A) LAeq, 16 hr	30 dB(A) LAeq, 8 hr

Table 4.2 - BS8233 Indoor Guideline Values

4.4.2 It is usually considered that an open window will provide a reduction of some 10-15 dB(A)[2]. Therefore the 'good' internal standards quoted above would broadly equate to the following targets immediately outside the buildings:

Activity	Location	0700 - 2300	2300 - 0700
Resting	Living Room	48 dB(A) LAeq, 16 hr	-
Dining	Dining room/Area	53 dB(A) LAeq, 16 hr	-
Sleeping	Bedroom	48 dB(A) LAeq, 16 hr	43 dB(A) LAeq, 8 hr

Table 4.3 - BS8233 Derived Facade Guideline Values

4.4.3 BS8233 recognises that, where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB, and reasonable conditions will be achieved.

4.4.4 It should be noted that the levels quoted in BS8233 are intended to reflect the acceptability of steady, continuous noise. Sources of intermittent and tonal noise may generate greater annoyance for a similar overall magnitude. Whilst BS8233 does not explicitly state a correction for those circumstances, it may be appropriate to consider that the Good and Reasonable standards would be achieved with levels which are perhaps 5 dB lower than stated in the table above.

[2] Reference PPG24 Planning & Noise, which adopted a mid-range value of 13 dB(A)

4.4.5 It is also noted that BS8233 was written from a view of designing new buildings to protect occupants from existing noise sources. This does necessarily infer, however, that the acceptability of an occupant to an absolute level noise within a building will be different if the introduction of the noise source post-dates the construction of the building.

4.5 World Health Organisation Guidelines

4.5.1 Further advice is provided in the 1999 WHO report "Guidelines for Community Noise".

4.5.2 This indicates that the steady noise level in external amenity areas, such as gardens or outdoor living areas should not exceed 55 dB(A) $L_{Aeq,\,t}$, and should preferably be designed below 50 dB(A) $L_{Aeq,\,t}$.

4.5.3 The document also provides guidance on the impact of peak noise levels on sleeping conditions. This suggests that levels above 45 dB(A) L_{Amax} inside a bedroom would be disturbing to sleep. With windows open, this would equate to a level of approximately 58 dB(A) L_{Amax} externally.

4.6 BS 4142:2014+A1:2019: Methods for Rating & Assessing Industrial & Commercial Sound

4.6.1 Any formal assessment of commercial noise affecting residential properties would in all likelihood be based upon the recommendations of British Standard 4142:2014+A1:2019 "Methods for rating and assessing industrial and commercial sound".

4.6.2 In brief, this rating method determines "specific sound level" generated by the new plant, assessed immediately outside the residential properties most likely to be affected. For daytime (07.00 – 23.00) only operation of the new plant, this would be the equivalent continuous noise level of the new noise, evaluated over a 1-hour sampling period, its $L_{Aeq,1hr}$. For plant operating during the night-time (23.00 – 07.00) only the reference time interval is 15 minutes.

4.6.3 Corrections of up to + 9 dB (A) are then made to this "specific sound level" if the new noise has certain acoustic features such as tonality, impulsivity, intermittency and any other sound characteristics, to give the "rating level".

4.6.4 An assessment of the impact of the specific sound level can be determined by subtracting the measured background level from the rating level and consider the following.

a) Typically, the greater this difference, the greater the magnitude of the impact.

b) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.

c) A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.

d) The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

NOTE: Adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact.

4.6.5 It is likely that the Local Authority would seek to avoid marginal situations at the planning stage and may try to ensure a positive likelihood that no complaints would be forthcoming. As such, they might recommend a noise target which limits the Rating Noise Level to a maximum which is as low as 5 - 10 dB(A) below the minimum background level currently experienced.

4.6.6 However, there are limitations to BS4142 if noise levels are very low, and in such circumstances, it may not be necessary to follow the normal guidance in order to achieve this aim. Indeed, within the Scope of the Standard, it is stated:

"The method is not suitable for assessing the noise measured inside buildings or when the background and rating noise levels are both very low.

Note: for the purpose of this Standard, background noise levels below about 30 dB and rating noise level below about 35 dB are considered to be very low."

4.7 Arun District council Local Plan 2011 – 2031 (Adopted July 2018)

4.7.1 Policy QE DM1 Noise Pollution sets out the council's targets for protecting amenity, whether new noise sensitive properties are being considered and when new noise generating activities are proposed.

4.7.2 In respect of the latter, the policy states:

Developers proposing new noise generating development must seek advice from an early stage to determine the level of noise assessment required. Proposals will need to be supported by:

a. Evidence to demonstrate that there are no suitable alternative locations for the development.

b. A noise report which provides accurate information about the existing noise environment, and the likely impact of the proposed development upon the noise environment. The report must also demonstrate that the development meets appropriate national and local standards for noise, as set out in Annex 1 of the Planning Noise Advice Document: Sussex, and any mitigation measures required to ensure noise is managed to an acceptable level.

c. Evidence to demonstrate that the development will not impact upon areas identified and valued for their tranquillity, including Gaps Between Settlements which are important to the enjoyment of Arun's countryside, its habitats and biodiversity

4.8 Planning Noise Advice Document, Sussex (November 2023)

4.8.1 This document is jointly published on behalf of a number of Local authorities within West and East Sussex. It sets out the criteria to be adopted across the district for many types of acoustic appraisal. In respect of industrial development, potentially involving new noise sources, the document confirms (Section 3):

3.0 Industrial and Commercial Sound Sources

3.1 Scope

3.1.1 This section covers sound sources of an industrial and commercial nature. It refers to sound sources within the scope of the British Standard BS 4142:2014 + A1: 2019 "Methods for Rating and Assessing Industrial and Commercial Sound" and other industrial and commercial sources, as detailed.

3.1.2 Appropriate sound sources for assessment under BS 4142 are detailed in section 1.1 of the scope of the Standard and include:

- *Sound from industrial and manufacturing processes*
- *Sound from fixed installations, which comprise mechanical and electrical plant*
- *Sound from loading and unloading goods*
- *Sound from mobile plant and vehicles that are an intrinsic part of the overall sound emanating from the premises or process e.g. fork-lift truck movements etc.*

3.1.2. This section would also be appropriate for some aspects of waste and minerals developments (see Annex 1, of this document, for standards applicable to waste and minerals sites).

3.2 Guidelines and Criteria

3.2.1 The rating level of the industrial or commercial sound source should, where practicable, achieve a level no greater than the representative background sound, when measured in accordance with BS 4142:2014 + A1: 2019. There may be instances, for specific sites, where a rating level below background is deemed appropriate. This can be determined through discussion with the Local Planning Authority (LPA). A rating level below background may be required if there are concerns for potential noise creep, for example in a High Street setting. It is considered that meeting this criterion would avoid adverse noise impacts, in the interests of ensuring a good standard of amenity and protecting human health. Where these criteria are not attainable, the noise report should explain why, and how best practicable means will be implemented to control noise in order to satisfy the LPA that the development is acceptable. At all times the reports shall have regard to the context. Good Acoustic Design will be a consideration for any mitigation proposals

5. PREDICTED ACTIVITY NOISE LEVELS

5.0.1 This section will provide predictions of noise levels associated with each main noise source emanating from activities associated with the new building and assess them against the criterion set out in section 4 of this report.

5.0.2 Noise levels will be predicted and assessed at 1m from facades of the nearest noise sensitive receptors (NSR), namely those of Oldlands Farm Cottages.

5.1 External Noise Within Yard

5.1.1 The noise associated with this activity will be vehicles arriving, reversing into unloading bays and vehicles departing.

5.1.2 Whilst the operator of the new building is yet to be determined, the assessment has considered a worst reasonable case regarding external activity within a B2/B8 yard.

5.1.3 In order to provide a sensible prediction, it will be taken that vehicle movements within the yard will be in the order of 5 vehicles arriving and departing within any 15-minute period during the day or night.

5.1.4 Data from previous projects shows that an indicative noise level for a HGV to drive in, reverse and park was c.71 dB(A) measured over a period of 54secs and 5m away from the vehicle. Similarly, for the same vehicle to drive away from the loading bay and out of site was c.67 dB(A) over an 11sec period and 7m away.

5.1.5 The average distances from a lorry entering site and parking in an unloading bay to the NSR are:

- Unit 1 – 60m
- Unit 2 – 175m
- Unit 3 – 210m

5.1.6 Based on the worst reasonable case scenario, **a 2.75m high acoustic barrier on top of a 3m earth bund** has been included within the assessment. This will be required to the south-east of the site, as indicated in Figure 5. The fence should be a proprietary barrier, such as a Jakoustic Acoustic Reflective Barrier, or similar performing barrier (the construction of which should be approved by the Acoustic Consultant).

5.1.7 Table 5.1 provides the predicted noise levels at the NSR, based on the noise levels and manoeuvring times stated within Para 5.7, the distance corrections from source to receiver (taken as a point source) stated within Para 5.8 and the movements described in Para 5.5, associated with each unit.

BUILDINGS		UNIT 1		UNIT 2		UNIT 3	
DAYTIME		**Arrive**	**Depart**	**Arrive**	**Depart**	**Arrive**	**Depart**
Movements in 1hr		20	20	20	20	20	20
L_{Aeq} of movement	dB	71	67	71	67	71	67
Duration of movement	s	54	11	54	11	54	11
L_{AX} of movement	dB	88	77	88	77	88	77
Total L_{AX} for all movement in period	dB	101	90	101	90	101	90
Distance of original measurement	m	4	7	4	7	4	7
Distance to NSR	m	60	60	175	175	210	210
Distance Correction	dB	-24	-19	-33	-28	-34	-30
Barrier Correction	dB	-16	-16	-22	-22	-21	-21
Façade Correction	dB	3	3	3	3	3	3
Time Correction to 1 hr	dB	-36	-36	-36	-36	-36	-36
Predicted $L_{Aeq,1hr}$ at 1m from NSR	**dB**	**29**	**23**	**14**	**8**	**13**	**7**
Combined $L_{Aeq,1hr}$ at 1m from NSR	**dB**	**30**		**15**		**14**	
NIGHT-TIME		**Arrive**	**Depart**	**Arrive**	**Depart**	**Arrive**	**Depart**
Movements in 15mins		3	3	3	3	3	3
L_{Aeq} of movement	dB	71	67	71	67	71	67
Duration of movement	s	54	11	54	11	54	11
L_{AX} of movement	dB	88	77	88	77	88	77
Total L_{AX} for all movement in period	dB	93	82	93	82	93	82
Distance of original measurement	m	4	7	4	7	4	7
Distance to NSR	m	60	60	175	175	210	210
Distance Correction	dB	-24	-19	-33	-28	-34	-30
Barrier Correction	dB	-16	-16	-22	-22	-21	-21
Façade Correction	dB	3	3	3	3	3	3
Time Correction to 15mins	dB	-30	-30	-30	-30	-30	-30
Predicted $L_{Aeq,15mins}$ at 1m from NSR	**dB**	**27**	**21**	**11**	**6**	**11**	**5**
Combined $L_{Aeq,15mins}$ at 1m from NSR	**dB**	**28**		**12**		**12**	

Table 5.1 – Predicted Noise Levels dB(A) in Service Yard from HGV's.

5.1.8 It is unclear what the buildings will be eventually used for, but it is likely that there will be a degree of unloading / loading within the yard using forklift trucks.

5.1.9 The prediction of noise from Fork Lift tucks (Table 5.2) is based on the following details:

(i) Reference noise of continuous fork lift activity (by survey) is a level of 67 dB(A) $L_{Aeq,\ 120s}$, at a distance of 5m,
(ii) Distances to NSR same as stated in Para 5.8,
(iii) Assessment is based on the suggested 'on-time' of 50%, during the day time reference period (1 hr) and during the night time reference period (15 mins).

		UNIT 1		UNIT 2		UNIT 3	
		Day	**Night**	**Day**	**Night**	**Day**	**Night**
Reference Noise Level $L_{Aeq,\ 120s}$	dB	67	67	67	67	67	67
BS4142 Reference Period, T_r	sec	3600	900	3600	900	3600	900
Equivalent Noise Level over Reference period, (if continuous operation)	dB	67	67	67	67	67	67
% on Time	%	50	50	50	50	50	50
Correction for % on time	dB	-3	-3	-3	-3	-3	-3
Measurement distance	m	5	5	5	5	5	5
Distance to NSR	m	60	60	175	175	210	210
Correction for Distance	dB	-22	-22	-31	-31	-32	-32
Barrier Attenuation	dB	-16	-16	-19	-19	-17	-17
Façade Correction at houses	dB	3	3	3	3	3	3
Predicted $L_{Aeq,\ tr}$	**dB**	**29**	**29**	**17**	**17**	**18**	**18**

Table 5.2 – Predicted Noise Levels dB(A) in Service Yard from Forklifts.

5.2 Building Break-Out Noise

5.2.1 It is unknown what level of noise is likely to be produced inside the building so for the purposes of this report a reference internal noise level of 85 dB(A) will used as this is the upper exposure action value of the Noise At Work Regulations 2021.

5.2.2 The eastern elevation of the proposed new buildings will be the main areas of noise break-out, and the construction of the external walls have been confirmed as,

- HPS200 Ultra external cladding sheet,
- Nominally 25mm insulation,
- 19mm thick internal lining sheet,
- Fixed to steel purlins.

5.2.3 These elevations also consist of roller shutter doors and a series of loading bays.

5.2.4 It is unknown what the exact construction of these areas are, so calculations of the predicted break-out noise have been based on a lightweight corrugated metal construction.

5.2.5 Table 5.3 shows the predicted break-out noise level at the NSR emanating from each of the units.

UNIT 1										
Frequency	**Hz**	**63**	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**	**dB(A)**
Internal Noise Level LAeq	**dB**	80	80	81	84	80	75	73	72	**85**
East Façade Wall (R_w)	dB	-18	-20	-21	-35	-47	-36	-45	-45	
Area correction, 500m^2	dB	27	27	27	27	27	27	27	27	
Distance correction, 81m	dB	-38	-38	-38	-38	-38	-38	-38	-38	
Directivity	dB	-14	-14	-14	-14	-14	-14	-14	-14	
Net SPL from walls	dB	37	35	35	24	8	14	3	2	**28**
Shutter Doors (R_w)	dB	-11	-14	-18	-23	-28	-33	-38	-40	
Area correction, 60m^2	dB	18	18	18	18	18	18	18	18	
Distance correction, 81m	dB	-38	-38	-38	-38	-38	-38	-38	-38	
Directivity	dB	-14	-14	-14	-14	-14	-14	-14	-14	
Net SPL inside via vent	dB	35	32	29	27	18	8	1	-2	**26**
Combined Level from elements	**dB**	**39**	**37**	**36**	**28**	**18**	**15**	**5**	**3**	**30**
Barrier Correction	dB	-9	-9	-9	-9	-9	-9	-9	-9	
Facade Correction	dB	3	3	3	3	3	3	3	3	
Predicted Facade Noise Level	**dB**	**33**	**31**	**30**	**22**	**12**	**9**	**-1**	**-3**	**24**

Contd overleaf

UNIT 2										
Frequency	**Hz**	**63**	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**	**dB(A)**
Internal Noise Level LAeq	**dB**	80	80	81	84	80	75	73	72	**85**
East Façade Wall (R_w)	dB	-18	-20	-21	-35	-47	-36	-45	-45	
Area correction, 1687m^2	dB	32	32	32	32	32	32	32	32	
Distance correction, 200m	dB	-46	-46	-46	-46	-46	-46	-46	-46	
Directivity	dB	-14	-14	-14	-14	-14	-14	-14	-14	
Net SPL from walls	dB	34	32	32	21	5	11	0	-1	**25**
Shutter Doors (R_w)	dB	-11	-14	-18	-23	-28	-33	-38	-40	
Area correction, 280m^2	dB	24	24	24	24	24	24	24	24	
Distance correction, 200m	dB	-46	-46	-46	-46	-46	-46	-46	-46	
Directivity	dB	-14	-14	-14	-14	-14	-14	-14	-14	
Net SPL inside via vent	dB	33	30	27	25	16	6	-1	-4	**25**
Combined Level from elements	**dB**	**37**	**34**	**33**	**27**	**17**	**12**	**3**	**1**	**28**
Barrier Correction	dB	-19	-19	-19	-19	-19	-19	-19	-19	
Facade Correction	dB	3	3	3	3	3	3	3	3	
Predicted Facade Noise Level	**dB**	**21**	**18**	**17**	**11**	**1**	**-4**	**-13**	**-15**	**12**

UNIT 3										
Frequency	**Hz**	**63**	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**	**dB(A)**
Internal Noise Level LAeq	**dB**	80	80	81	84	80	75	73	72	**85**
East Façade Wall (R_w)	dB	-18	-20	-21	-35	-47	-36	-45	-45	
Area correction, 875m^2	dB	29	29	29	29	29	29	29	29	
Distance correction, 220m	dB	-47	-47	-47	-47	-47	-47	-47	-47	
Directivity	dB	-14	-14	-14	-14	-14	-14	-14	-14	
Net SPL from walls	dB	31	29	29	18	2	8	-3	-4	**22**
Shutter Doors (R_w)	dB	-11	-14	-18	-23	-28	-33	-38	-40	
Area correction, 80m^2	dB	19	19	19	19	19	19	19	19	
Distance correction, 220m	dB	-47	-47	-47	-47	-47	-47	-47	-47	
Directivity	dB	-14	-14	-14	-14	-14	-14	-14	-14	
Net SPL inside via vent	dB	27	24	21	19	10	0	-7	-10	**19**
Combined Level from elements	**dB**	**32**	**30**	**29**	**21**	**11**	**8**	**-2**	**-3**	**24**
Barrier Correction	dB	-19	-19	-19	-19	-19	-19	-19	-19	
Facade Correction	dB	3	3	3	3	3	3	3	3	
Predicted Facade Noise Level	**dB**	**16**	**14**	**13**	**5**	**-5**	**-8**	**-18**	**-19**	**8**

Table 5.3 – Calculation of Building Break-out Noise

5.3 Building Services Plant Noise

5.3.1 It is understood that there is likely to be some building services plant associated with the new building, however, the exact details are unknown at this stage, and all such equipment will be designed as the development progresses.

5.3.2 Section 3.2 of the Planning Noise Advice Document; Sussex dated September 2021 states,

> *'The rating level of the industrial or commercial sound source should, where practicable, achieve a level no greater than the representative background sound, when measured in accordance with BS 4142:2014 + A1: 2019.'*

5.3.3 The representative background L_{A90} noise levels for this project are 48 dB(A) for the daytime and 37 dB(A) for the night-time.

5.3.4 Mindful of the potential contribution of noise from within the building and vehicle activity in the yard, it is therefore recommended that the following design targets be applied to the project:

> ***Noise from any new building services plant shall be limited to the following Rating Noise Levels, when assessed at 1m from the facade of nearest residential receptors:***
>
> | | |
> |---|---|
> | ***07.00 – 23.00hrs*** | ***40 dB(A)*** $L_{Aeq,1hr}$ |
> | ***23.00 – 07.00hrs*** | ***29 dB(A)*** $L_{Aeq,15mins}$ |

6. ASSESSMENT OF PREDICTED NOISE LEVELS

6.1 Section 5 of this report has provided the predicted daytime and night-time noise levels associated with the probable main noise sources assessed at 1m from the façade of the NSR. These are summarized in Table 6.1.

PREDICTED FAÇADE NOISE LEVELS, dB(A)		
Noise Source	**Daytime $L_{Aeq,1hr}$**	**Night-time $L_{Aeq,15mins}$**
Combined Noise from HGV activities	30	28
Combined Noise from Forklift Trucks	24	24
Combined Break-out Noise from Building	29	29
Noise from Building Services Plant	40	29
Overall Combined Noise Level	**41**	**34**

Table 6.1 – Summary of Predicted Noise Levels, dB(A).

6.2 In respect of BS4142 assessments, the measured noise level is corrected, where appropriate, to reflect the particular audibility of a noise. The corrections relate to:

Tonality – corrections between 0 and + 6dB can be made depending on whether there is no subjective tonality to the noise, or whether tonality is just, clearly or highly perceptible.

Concern has been expressed that reversing beepers on forklift trucks and HGVs may give rise to tonality. In this development, it may be necessary to condition tenants to use non-tonal reversing alarm, such as white noise alarms. These use broadband frequencies, giving greater directional information to the ear (and hence improved safety implications.

Impulsivity – corrections between 0 and +9dB can be made depending on if a sound is highly impulsive. This correction is targeted more towards noise associated with explosions rather than intermittent, short term increases in the noise level.

On a new scheme such as this, it should be possible to smooth surfaces for vehicle movements, and to manage operations in a fashion that minimised any impacts in the process.

Intermittency – This correction is applied when the sound has a clear on/off condition, suggesting sudden and significant steps in the noise level from one steady condition to another.

6.3 In the round (and with controls over reversing alarms), it could be argued that a 3 dB correction might be applied to reflect the fact that the noise from the site could be readily distinguished against the pre-existing acoustic climate.

6.4 On that basis, a BS4142 assessment would be as follows:

		Day Time	Night Time
Specific noise level, $L_{Aeq,Tr}$	dB	41	34
BS4142 Corrections	dB	+3	+3
Rating Level, $L_{Ar,tr}$	dB	44	37
Assessed Background Noise Level, L_{A90}	dB	48	37
Excess of Rating over Background	**dB**	**-4**	**0**

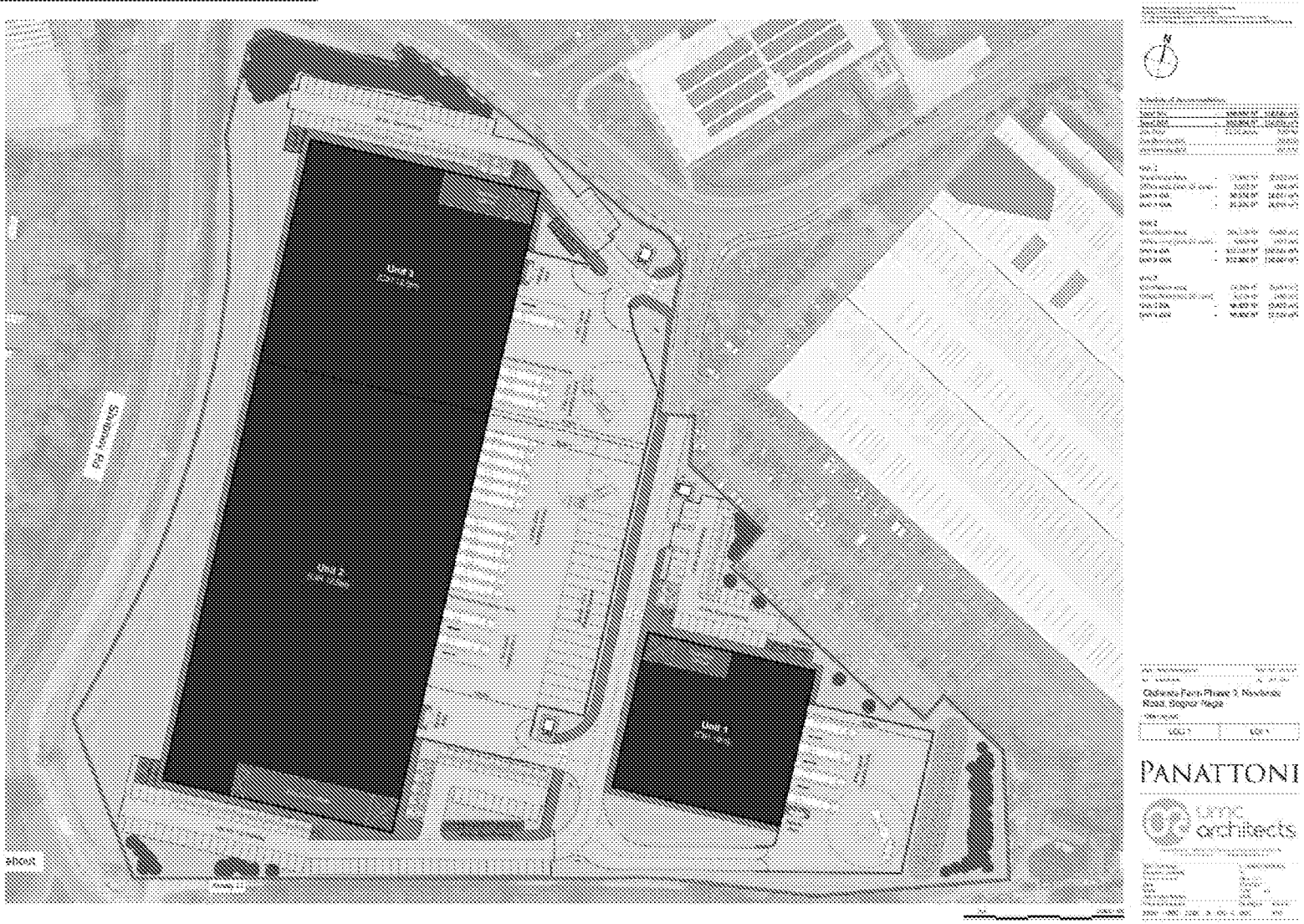
6.5 As previously mentioned, Section 3.2 of the Planning Noise Advice Document; Sussex dated September 2021 states,

> *'The rating level of the industrial or commercial sound source should, where practicable, achieve a level no greater than the representative background sound, when measured in accordance with BS 4142:2014 + A1: 2019.'*

6.6 During the daytime, there is an excess of rating over background is -4dB, and at night-time it is level, therefore, the criterion will be met.

FIGURE 1: SITE LOCATION PLAN

FIGURE 2: PROPOSED SITE LAYOUT



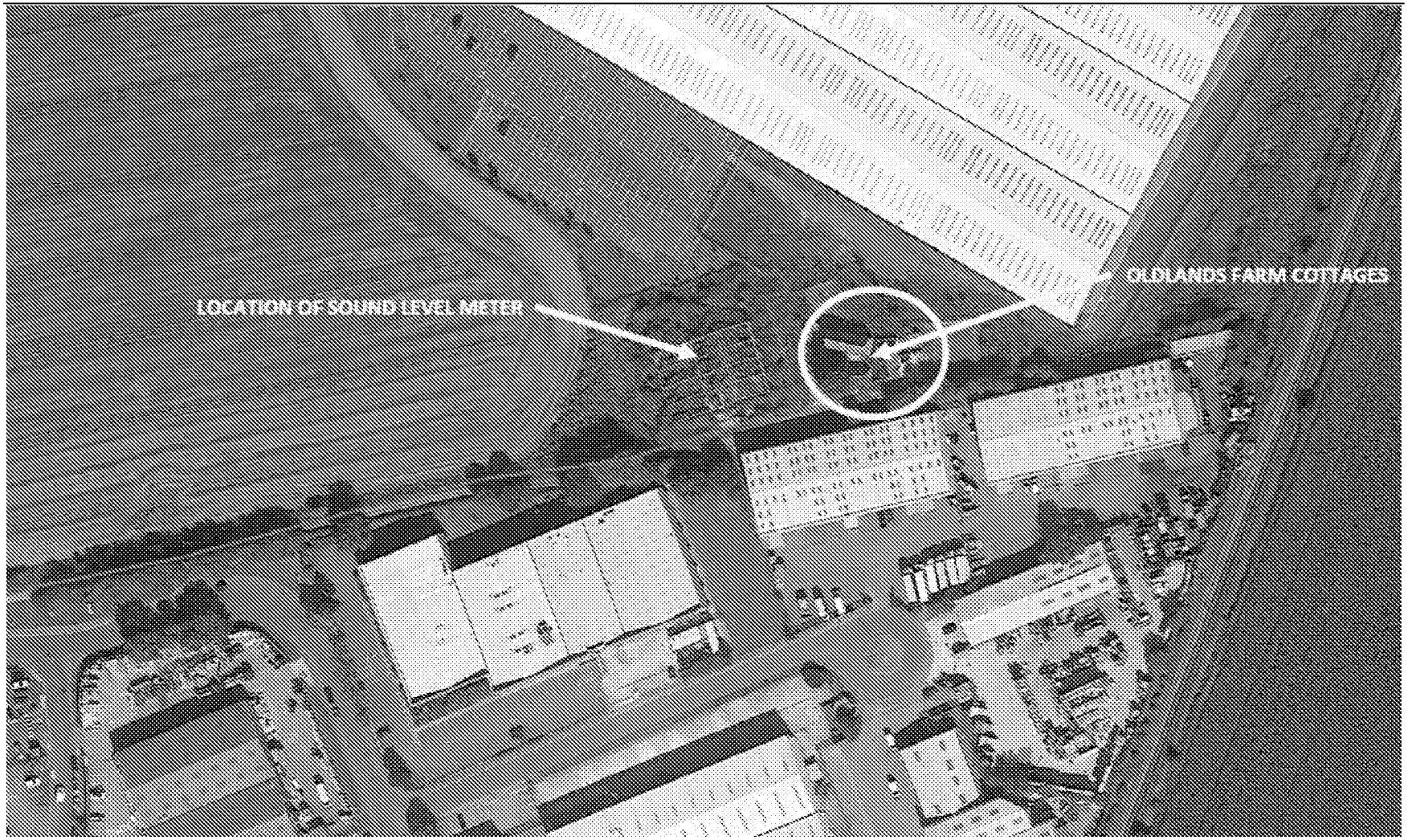


FIGURE 3: MONITORING LOCATION

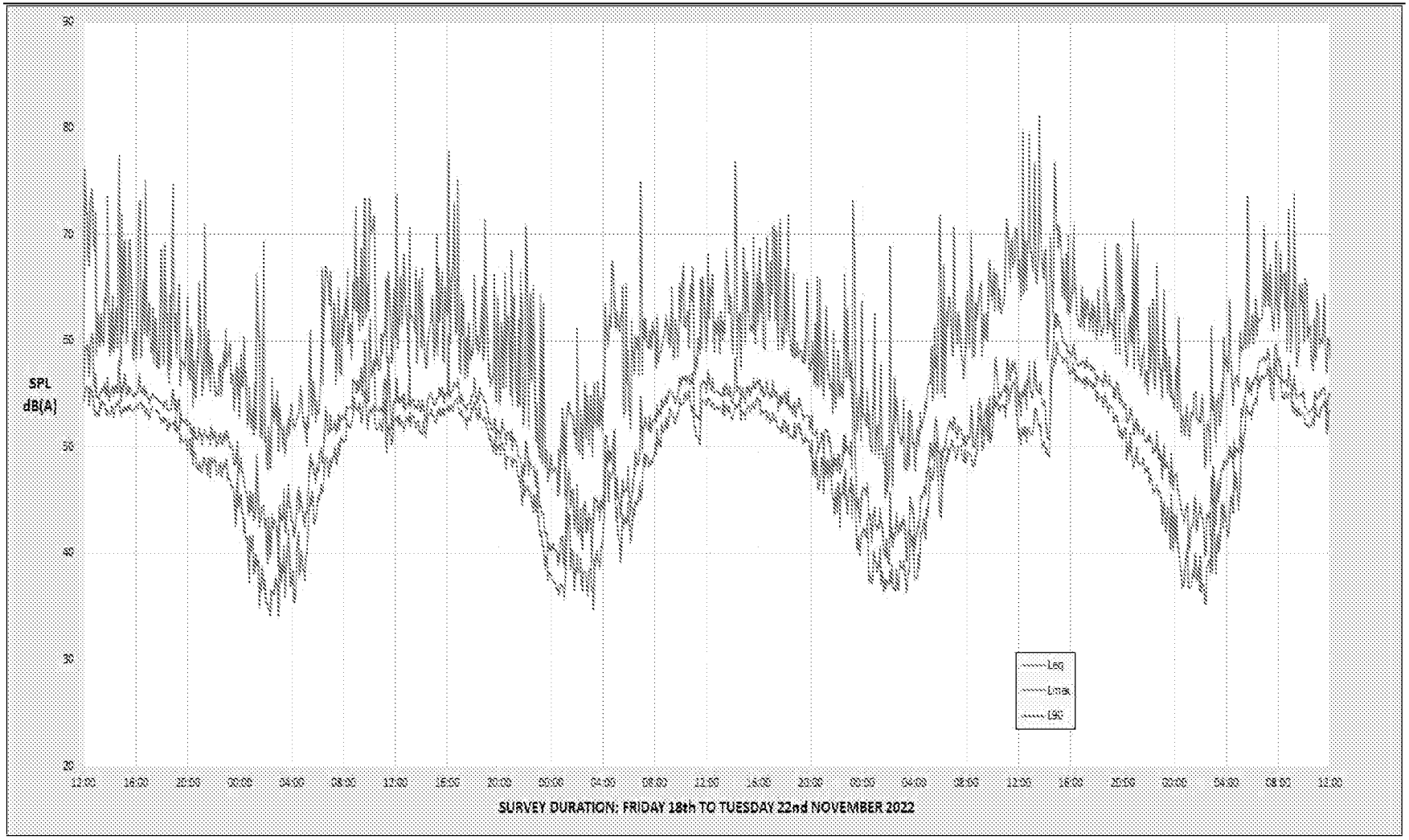
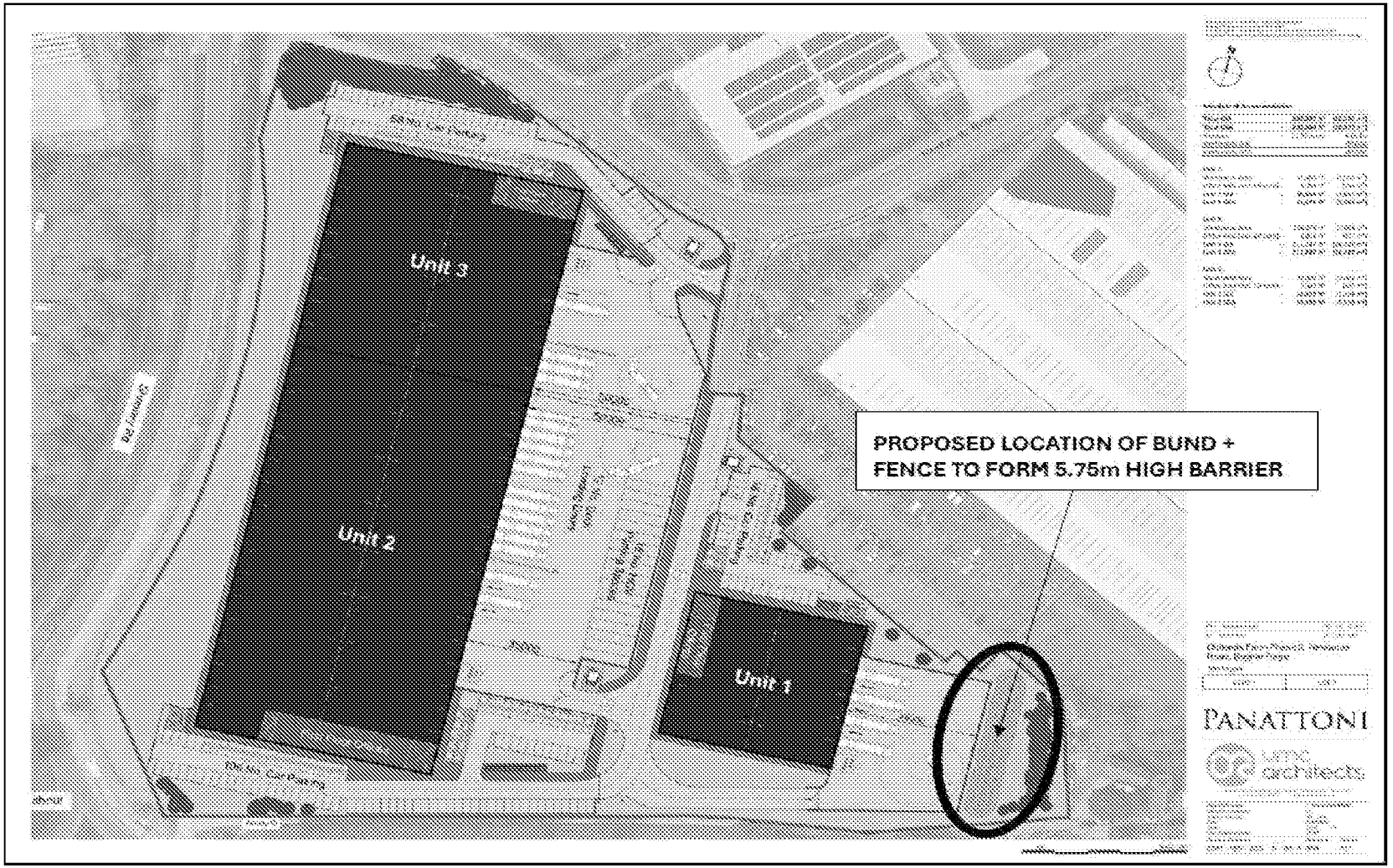


FIGURE 4: VARIATION OF AMBIENT NOISE LEVELS

FIGURE 5: EXTENTS OF PROPOSED ACOUSTIC BARRIER



APPENDIX I: TERMINOLOGY RELATING TO NOISE

Sound Pressure	Sound, or sound pressure, is a fluctuation in air pressure over the static ambient pressure.
Sound Pressure Level	The sound level is the sound pressure relative to a standard reference pressure of 20μPa (20x10-6 Pascals) on a decibel scale.
Decibel (dB)	A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds s1 and s2 is given by 20 log10 (s1 / s2). The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is 20μPa.
A-weighting, dB(A)	The unit of sound level, weighted according to the A scale, which considers the increased sensitivity of the human ear at some frequencies.
Noise Level Indices	Noise levels usually fluctuate over time, so it is often necessary to consider an average or statistical noise level. This can be done in several ways, so a number of different noise indices have been defined, according to how the averaging or statistics are carried out.
Leq,T	A noise level index called the equivalent continuous noise level over the time period T. This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded.
Lmax,T	A noise level index defined as the maximum noise level during the period T. Lmax is sometimes used for the assessment of occasional loud noises, which may have little effect on the overall Leq noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
L90,T	A noise level index. The noise level exceeded for 90% of the time over the period T. L90 can be considered to be the "average minimum" noise level and is often used to describe the background noise.
L10,T	A noise level index. The noise level exceeded for 10% of the time over the period T. L10 can be considered to be the "average maximum" noise level. Generally used to describe road traffic noise.
Free-Field	Far from the presence of sound reflecting objects (except the ground), usually taken to mean at least 3.5m.
Façade Noise Level	At 1m in front of a large sound reflecting object such as a façade.
Fast/Slow Time Weighting	Averaging times used in sound level meters.
Octave Band	Range of frequencies whose upper limit is twice the lower limit.
DnT,w	The single number quantity that characterises airborne sound insulation between rooms over a range of frequencies.
Rw	Single number quantity that characterises the airborne sound insulating properties of a material or building element over a range of frequencies.