Noise Impact Assessment for a Scrap Metal Yard

Client Name:	D.H. Armitage Transport Ltd.
Client Address:	Fairfield Garage, Sheffield Road, Hoyland Common, Barnsley, S74 0DP
Site Address:	D.H. Armitage Transport, Sheffield Road, Barnsley, S74 0DP
Date:	20/04/2022

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Date	20/04/2022
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Executive Summary

An environmental noise survey and noise impact assessment have been undertaken at D.H. Armitage Transport, Sheffield Road, Barnsley, S74 0DP to assess the potential increase in noise levels from the extension of an HGV transport yard on the surrounding Noise Sensitive Receptors (NSR). The measured background sound levels have allowed a BS4142:2014 noise assessment to be carried out.

The BS4142:2014 assessment indicates that providing the recommendations specified within this are implemented, the rating noise emissions from the proposed site extension are not predicted to exceed the background noise level during the sensitive night time period. This is classed as 'Low Impact' when assessed with BS4142:2014 and 'No Observed Effect Level' ('NOEL') when assessed with the NPPF and NPSE.

It is important to note that the assessment has been undertaken considering a worst-case scenario. For the majority of the time on site, minimal activities are likely to be taking place in the extension which will reduce the level of impact further.

A summary of the recommendations is shown in the table below.

Recommendations and Mitigation Overview
- A 3m tall timber fence should be installed at the northern perimeter of the site. The fence must contain no holes or gaps and must have a minimum surface mass of 10 kg/m^2. - The proposed fence location is shown in Appendix C.

The findings of this report will require written approval from the Local Authority prior to work commencing.

1. Introduction

Overview

NOVA Acoustics Ltd has been commissioned to prepare a noise assessment for an HGV transport company (the Proposed Development') D.H. Armitage Transport, Sheffield Road, Barnsley, S74 0DP ('the Site').

The applicant is preparing a planning application to be submitted ('the Application') to Barnsley Council.

The following technical noise assessment has been prepared to support the retrospective planning application and appeal process. This report details the existing background sound climate at the nearest receptors, as well as the sound emissions associated with the Proposed Development.

This noise assessment is necessarily technical in nature; therefore, a glossary of terms is included in Appendix A to assist the reader.

Scope & Objectives

The scope of the noise assessment can be summarised as follows:

- Baseline sound monitoring survey to evaluate the prevailing background sound levels at the nearest sensitive receptor ('NSR') to the Site.
- Detailed sound modelling, acoustic calculation and analysis in accordance with; ISO9613 – 1 ISO 9613-2 - Attenuation of sound during propagation outdoors prediction methodology, to predict sound levels at the NSR.
- A detailed assessment of the suitability of the Site, in accordance with relevant standards in respect of sound from the proposed sources; and
- Recommendation of mitigation measures, where necessary, to comply with the requirements of the National Planning Policy Framework (2021), Noise Policy Statement for England (2010) and British Standard BS4142:2014+A1:2019 – 'Methods for rating and assessing industrial and commercial sound'. Further information on the legislation can be found in Appendix B.

2. Environmental Noise Survey

Measurement Methodology

In order to characterise the sound profile of the area at the closest sensitive receptor (NSR), an environmental sound survey was carried out from the 04/03/22 to 05/03/22. For the long-term sound monitoring, a sound level meter was attached to a lamppost on Green Lane with the microphone positioned approximately 3.5m from the ground. The monitoring position was chosen in order to collect representative sound levels at the NSRs during the typical operational periods of the proposed development. Short-term monitoring was also undertaken of activities and processes taking place on site. The long-term monitoring location is shown in Figure 1.0 below.

Figure 1.0 – Indicative Site Layout

Context & Subjective Impression

The area surrounding the site is primarily residential in nature with a minority of commercial premises to the east and immediate west. The noise profile of the area is dominated by traffic flow from Sheffield Road (A6135) and the M1 Motorway to the west. It is assumed that traffic flow on Tankersley Lane will also contribute to the background noise levels, however this road was closed at the time of measurement due to ongoing works at the newly erected Hermes Warehouse to the north-west. The closest NSRs are located to the north of site.

Background

The proposed site extension is located in the northern section of the site and borders the rear gardens of properties located on Tankersley Lane. The land is currently unused by the client, and it is proposed it will be utilised for storing HGVs and their respective trailers.

Environmental Noise Survey Results

The existing site currently operates 24 hours a day, 7 days a week. Activities in the proposed extension are also intended take place 24/7.

The table below outlines the background sound levels measured during the proposed operational period, that will be used as the baseline for the noise assessment. Further summary results for the entire measurement period can be found in Appendix D.

Measurement Position MP1				
Measurement Period ('t')	**$L_{A90,15min}$**	***SMR $L_{A90,15min}$**	**Min. $L_{A90,15min}$**	**Max. $L_{A90,15min}$**
04/01/22 – 23:00 – 07:00	51.0	**50.0**	46.0	54.0

Table 1.0 – Background Sound Level Summary Results

**Statistically Most Repeated*

As can be seen in the table above the statistically most repeated $L_{A90,15min}$ value is 50 dB. The range of measured background sound levels is relatively low and the statistical value sits in the centre of the range. As such, the statistically most repeated $L_{A90,15min}$ value is deemed 'typical' and will be used in the following assessment.

3. BS4142:2014 Noise Assessment

In the following section of the report, the noise emissions from the site are compared with the prevailing background sound level to calculate the level of impact. The client has informed NOVA Acoustics that it is likely there will be approximately 5 to 10 HGVs parked in the extension area per operational period, however, this could increase to a maximum of 20 depending on the job. The client has also stated that it is likely that there will be no more than 1 HGV movement in this area during a 15-minute assessment period. As such, the following will be included in the noise model:

- 1no. HGV entering / exiting the site,
- 1no. HGV manoeuvring into / out of a parking position,
- Unhitching of 5th Wheel,
- Hitching of 5th Wheel.

On-Site Activities and Machinery

The table below shows the noise levels of activities measured on site that will be used in the predictive noise model. A correction of +28 dB is applied to the measurements taken at 10m to calculate the sound power levels, as per BS5228:2009 guidance. It is important to note that the following noise levels present as a worst-case scenario. For the majority of the time, minimal activities are likely to take place and the noise emissions from the site are expected to be significantly reduced.

Onsite Plant Machinery and Processes			
Plant Type	**Process**	**Sound Pressure Level at 10m (L_{Aeq}, dB)**	**Calculated Sound Power Level (L_{wA}, dB)**
HGV	Unhitching 5th Wheel	66.0	94.0
HGV	Hitching 5th Wheel	66.0	94.0

Table 2.0 – Plant Equipment and Processes Noise Data

On-time corrections are then applied as shown in the following table to account for the length of time of each activity per 15-minute assessment period.

Onsite Plant Machinery and Processes – Time Corrected				
Plant Description	**Process**	**Calculated Sound Power Level (L_{wA}, dB)**	**On-Time Per 15 Mins**	**Corrected Sound Power Level (L_{wA}, dB)**
HGV	Unhitching 5th Wheel	94.0	2	85.0
HGV	Hitching 5th Wheel	94.0	2	85.0

Table 3.0 – Plant Equipment and Processes with On-Time Correction

Specific Sound Level HGV Movements

The table below shows the noise levels for an HGV entering / leaving the site and manoeuvring, taken from measurements conducted on-site. Corrections have then been applied to account for movement time per 15-minutes, considering a 1-minute onsite movement time.

Time period	Description	L_{wA} (dB)	Movement Time Per 15 mins	Time Corrected (L_{wA}, dB)
Night	Lorry (Moving Forward)	97.0	1	85.0
Night	Lorry (Reversing)	94.0	1	82.0

Table 4.0 – HGV Movement Noise Level

Noise Modelling

The following assumptions have been made within the calculation software:

- To accurately model the land surrounding the development the topographical data has been taken from Google Maps, it is assumed this has an accuracy within the last 3 years.
- The ground between the source and receiver is predominantly acoustically 'hard'.
- All noise levels shown in the tables above have been inputted into the noise model.
- The sound map below is shown at a grid height of 1.5m, however, the specific sound levels at the NSRs are taken from the worst affected area of the façade, which could be either the ground or 1st floor.

The sound map showing the specific sound level emissions from the proposed development can be seen below in Figure 2.0.

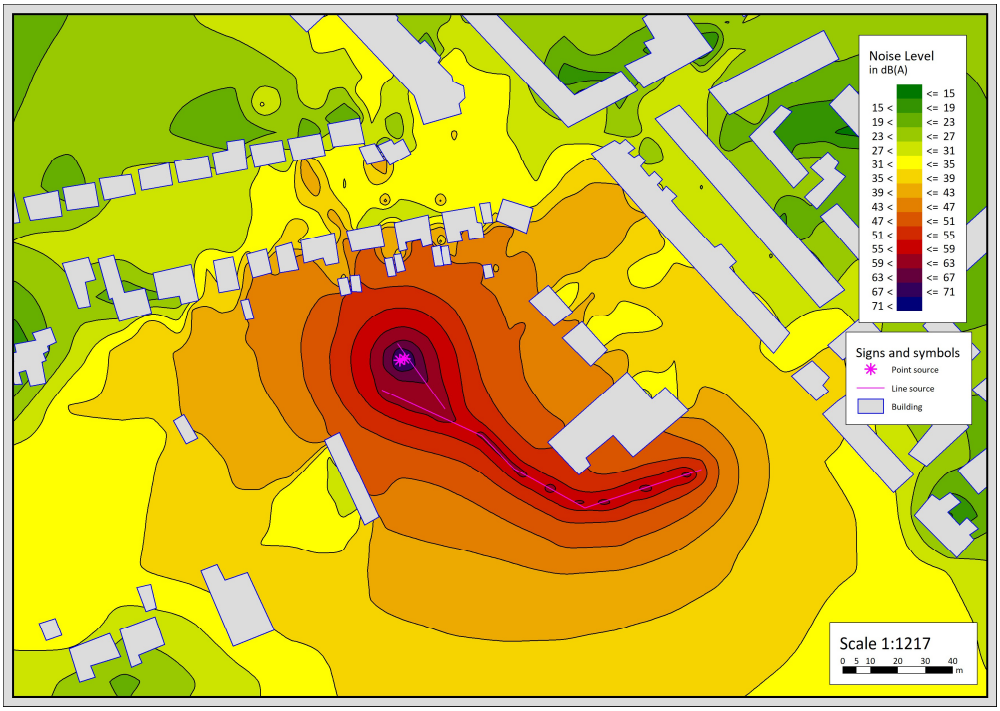


Figure 2.0 – Specific Sound Level Map – Night Time

A summary of the specific sound levels at the most affected NSRs, based on the sound map shown in Figure 2.0 can be seen in the following table.

Most Exposed NSR	Specific Sound Level (dBA)
1	48.0
2	48.0
3	45.0

Table 5.0 – Specific Sound Level at NSR Summary

Rating Penalty Assessment

The following section of the report analyses the expected impact from the noise emissions associated with the proposed development.

NSR	Specific Noise Level (dBA)	Acoustic Correction (dB)*	Rating Sound Level (dBA)
1	48.0	Impulsivity, +3.0 Intermittency, +3.0	54.0
2	48.0		54.0
3	45.0		51.0

Table 6.0 – Rating Noise Level at NSRs

**A +3 dB penalty is applied to account for the impulsive element of the noise emissions. A +3 dB penalty is applied to account for the audible intermittency of the noise emissions. A tonality correction is not applied as equipment on site is not considered to be tonal.*

BS 4142:2014 - Noise Impact Assessment

The BS4142 assessment of proposed development during the night time at the NSRs can be seen in the table below.

BS4142 Assessment			
Results	**NSR1 Sound Level (dBA)**	**NSR2 Sound Level (dBA)**	**NSR3 Sound Level (dBA)**
Rating Sound Level	54.0	54.0	51.0
Background Sound Level	50.0	50.0	50.0
Excess of Rating over Background Sound Level	+4.0	+4.0	+1.0

Table 7.0 – BS4142:2014 Noise Impact Assessment

Discussion

As can be seen in the assessment above, the rating sound level is predicted to be 4.0 dB above the background noise level at the most affected NSR. This is classed as 'Adverse Impact, Depending on

Context' when assessed with BS4142:2014 and 'Lowest Observed Adverse Effect Level' ('LOAEL') when assessed with the NPPF and NPSE. In order to reduce the level of impact it is recommended that mitigation is implemented.

4. Recommendations and Mitigation Measures

The following section of the report outlines the mitigation measures required to ensure the noise emissions from the site fall below the background sound level.

It is recommended that 3m tall, close-board timber fencing is installed at the northern boundary of the site. The fencing must contain no holes or gaps and must have a minimum surface mass of 10 kg/m^2. The proposed location of the fencing is shown in Appendix C.

The sound map of the mitigated scenario is shown in the figure below.

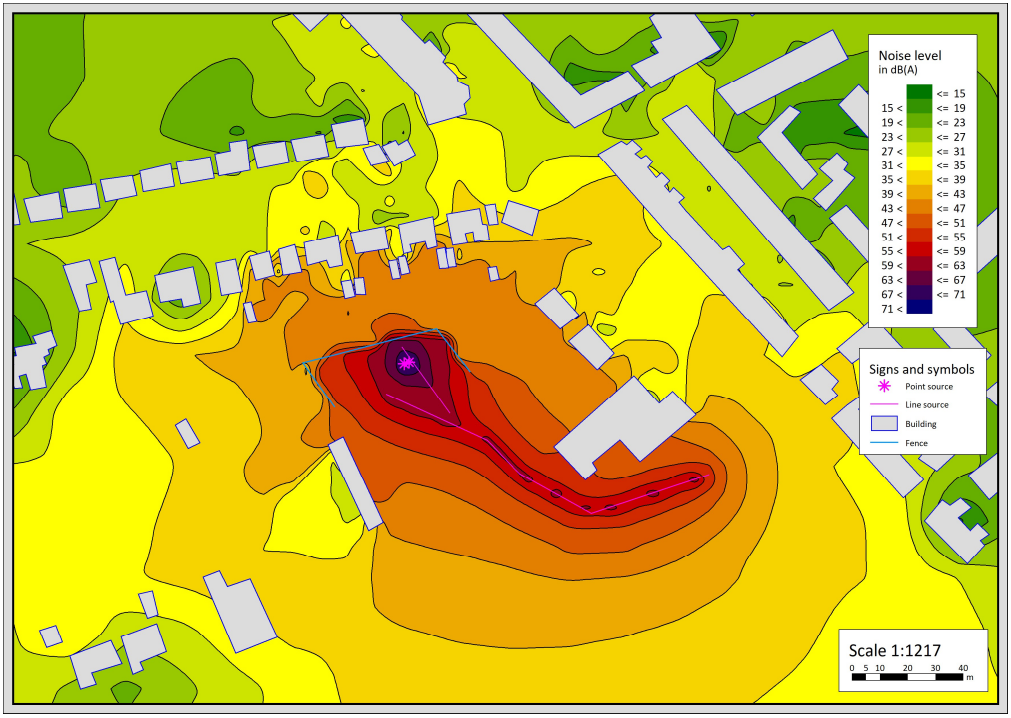


Figure 3.0 – Specific Sound Level Map Day Time – with Mitigation

A summary of the specific sound levels with mitigation implemented is shown in the following table.

Most Exposed NSR	Specific Sound Level (dBA)
1	44.0
2	44.0
3	43.0

Table 8.0 – Specific Sound Level at NSR Summary – with Mitigation

Rating Penalty Assessment

The calculated rating noise emissions are shown in the table below.

NSR	Specific Noise Level (dBA)	Acoustic Correction (dB)	Rating Sound Level (dBA)
1	44.0	Impulsivity, +3.0 Intermittency, +3.0	50.0
2	44.0		50.0
3	43.0		49.0

Table 9.0 – Rating Noise Level at NSRs – with Mitigation

BS 4142:2014 - Noise Impact Assessment

The BS4142 assessment of proposed development with mitigation can be seen in the table below.

BS4142 Assessment – with Mitigation			
Results	**NSR1 Sound Level (dBA)**	**NSR2 Sound Level (dBA)**	**NSR3 Sound Level (dBA)**
Rating Sound Level	50.0	50.0	49.0
Background Sound Level	50.0	50.0	50.0
Excess of Rating over Background Sound Level	0.0	0.0	-1.0

Table 10.0 – BS4142:2014 Noise Impact Assessment – with Mitigation

Discussion

As can be seen in the assessment above, considering the effects of the mitigation, the rating noise level is not predicted to exceed the prevailing background sound level during the most sensitive operational period. This is classed as 'Low impact' when assessed with BS4142:2014 and 'No Observed Effect Level' ('NOEL') when assessed with the NPPF and NPSE.

Appendix A – Acoustic Terminology

Sound Pressure	Sound, or sound pressure, is a fluctuation in air pressure over the static ambient pressure.
Sound Pressure Level (Sound 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 takes into account 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.
$L_{eq,T}$	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.
$L_{max,T}$	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.
$L_{90,T}$	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.
$L_{10,T}$	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
Facade	At a distance of 1m in front of a large sound reflecting object such as a building façade.
Fast Time Weighting	An averaging time used in sound level meters. Defined in BS 5969.

In order to assist the understanding of acoustic terminology and the relative change in noise, the following background information is provided. The human ear can detect a very wide range of pressure fluctuations, which are perceived as sound. In order to express these fluctuations in a manageable way, a logarithmic scale called the decibel, or dB scale is used. The decibel scale typically ranges from 0 dB (the threshold of hearing) to over 120 dB. An indication of the range of sound levels commonly found in the environment is given in the following table.

Sound Level	Location
0dB(A)	Threshold of hearing
20 to 30dB(A)	Quiet bedroom at night
30 to 40dB(A)	Living room during the day
40 to 50dB(A)	Typical office
50 to 60dB(A)	Inside a car
60 to 70dB(A)	Typical high street
70 to 90dB(A)	Inside factory
100 to 110dB(A)	Burglar alarm at 1m away
110 to 130dB(A)	Jet aircraft on take off
140dB(A)	Threshold of Pain

The ear is less sensitive to some frequencies than to others. The A-weighting scale is used to approximate the frequency response of the ear. Levels weighted using this scale are commonly identified by the notation dB(A).

In accordance with logarithmic addition, combining two sources with equal noise levels would result in an increase of 3 dB(A) in the noise level from a single source. A change of 3 dB(A) is generally regarded as the smallest change in broadband continuous noise which the human ear can detect (although in certain controlled circumstances a change of 1 dB(A) is just perceptible). Therefore, a 2 dB(A) increase would not normally be perceptible. A 10 dB(A) increase in noise represents a subjective doubling of loudness.

A noise impact on a community is deemed to occur when a new noise is introduced that is out of character with the area, or when a significant increase above the pre-existing ambient noise level occurs.

For levels of noise that vary with time, it is necessary to employ a statistical index that allows for this variation. These statistical indices are expressed as the sound level that is exceeded for a percentage of the time period of interest. In the UK, traffic noise is measured as the L_{A10}, the noise level exceeded for 10% of the measurement period. The L_{A90} is the level exceeded for 90% of the

time and has been adopted to represent the background noise level in the absence of discrete events. An alternative way of assessing the time varying noise levels is to use the equivalent continuous sound level, L_{Aeq}.

This is a notional steady level that would, over a given period of time, deliver the same sound energy as the actual fluctuating sound. To put these quantities into context, where a receiver is predominantly affected by continuous flows of road traffic, a doubling or halving of the flows would result in a just perceptible change of 3 dB, while an increase of more than 25%, or a decrease of more than 20%, in traffic flows represent changes of 1 dB in traffic noise levels (assuming no alteration in the mix of traffic or flow speeds).

Note that the time constant and the period of the noise measurement should be specified. For example, BS4142:2014 specifies background noise measurement periods of 1 hour during the day and 15 minutes during the night. The noise levels are commonly symbolised as $L_{A90,1hour}$ dB and $L_{A90,15mins}$ dB. The noise measurement should be recorded using a 'FAST' time response equivalent to 0.125ms

Appendix B – Legislation, Policy and Guidance

This report is to be primarily based on the following legislation, policy and guidance.

B.1 - National Planning Policy Framework (2021)

Government policy on noise is set out in the National Planning Policy Framework (NPPF), published in 2021. This replaced all earlier guidance on noise and places an emphasis on sustainability. In section 15, Conserving and enhancing the natural and local environment, paragraph 174e, it states:

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.

Paragraph 185 states:

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 a minimum potential adverse impact resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life.*
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.*

B.2 - Noise Policy Statement for England (2010)

Paragraph 185 of the NPPF also refers to advice on adverse effects of noise given in the Noise Policy Statement for England (NPSE). This document sets out a policy vision to:

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

To achieve this vision the Statement identifies the following three 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;*
- *Where possible, contribute to the improvement of health and quality of life.*

In achieving these aims the document introduces significance criteria as follows:

SOAEL – Significant Observed Adverse Effect Level

This is the level above which significant adverse effects on health and quality of life occur. It is stated that "significant adverse effects on health and quality of life should be avoided while also considering the guiding principles of sustainable development".

LOAEL – Lowest Observed Adverse Effect Level

This is the level above which adverse effects on health and quality of life can be detected. It is stated that the second aim above lies somewhere between LOAEL and SOAEL and 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."

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. This can be related to the third aim above, which seeks: "where possible, positively to improve health and quality of life through the pro-active management of noise while also considering the guiding principles of sustainable development, recognising that there will be opportunities for such measures to be taken and that they will deliver potential benefits to society. The protection of quiet places and quiet times as well as the enhancement of the acoustic environment will assist with delivering this aim."

The NPSE recognises that it is not possible to have a single objective noise-based measure that is mandatory and applicable to all sources of noise in all situations and provides no guidance as to how these criteria should be interpreted. It is clear, however, that there is no requirement to achieve noise levels where there are no observable adverse impacts but that reasonable and practicable steps to reduce adverse noise impacts should be taken in the context of sustainable development and ensure a balance between noise sensitive and the need for noise generating developments.

Any scheme of noise mitigation outlined in this report will, therefore, aim to abide by the above principles of the NPPF and NPSE whilst recognizing the constraints of the site.

B.3 - British Standard BS 4142:2014+A1:2019 - Methods for rating and assessing industrial and commercial sound

Overview

BS4142:2014 sets out a method to assess the likely effect of sound from factories, industrial premises or fixed installations and sources of an industrial nature in commercial premises, on people who might be inside or outside a dwelling or premises used for residential purposes in the vicinity.

The procedure contained in BS4142:2014 for assessing the effect of sound on residential receptors is to compare the measured or predicted sound level from the source in question, the $L_{Aeq,T}$ 'specific sound level', immediately outside the dwelling with the $L_{A90,T}$ background sound level.

Where the sound contains a tonality, impulsivity, intermittency and other sound characteristics, then a correction depending on the grade of the aforementioned characteristics of the sound is added to the specific sound level to obtain the $L_{Ar,Tr}$ 'rating sound level'. A correction to include the

consideration of a level of uncertainty in sound measurements, data and calculations can also be applied when necessary.

Rating Penalty

Section 9 of BS4142:2014 describes how the rating sound level should be derived from the specific sound level, by deriving a rating penalty.

BS4142:2014 states:

"Certain acoustic features can increase the significance of impact over that expected from a basic comparison between the specific sound level and the background sound level. Where such features are present at the assessment location, add a character correction to the specific sound level to obtain the rating level. This can be approached in three ways:

a) subjective method.
b) objective method for tonality.
c) reference method."

Due to the nature of the development the subjective method has been adopted to derive the rating sound level from the specific sound level. This is discussed in Section 9.2 of BS4142:2014, which states:

"Where appropriate, establish a rating penalty for sound based on a subjective assessment of its characteristics. This would also be appropriate where a new source cannot be measured because it is only proposed at that time, but the characteristics of similar sources can subjectively be assessed. Correct the specific sound level if a tone, impulse or other characteristics occurs, or is expected to be present, for new or modified sound sources."

BS4142:2014 defines four characteristics that should be considered when deriving a rating penalty, namely, tonality; impulsivity; intermittency; and other sound characteristics, which are defined as:

a) Tonality

A rating penalty of +2 dB is applicable for a tone which is "just perceptible", +4 dB where a tone is "clearly perceptible", and +6 dB where a tone is "highly perceptible".

b) Impulsivity

A rating penalty of +3 dB is applicable for impulsivity which is "just perceptible", +6 dB where it is "clearly perceptible", and +9 dB where it is "highly perceptible".

c) Other Sound Characteristics

BS4142:2014 states that where "the specific sound features characteristics that are neither tonal nor impulsive, though otherwise are readily distance against the residual acoustic environment, a penalty of +3 dB can be applied."

d) Intermittency

BS4142:2014 states that when the "specific sound has identifiable on/off conditions, the specific sound level ought to be representative of the time period of length equal to the reference time

interval which contains the greatest total amount of on time … if the intermittency is readily distinctive against the residual acoustic environment, a penalty of +3 dB can be applied."

Background Sound Level

The background sound level is the underlying level of sound over a period, T, and is indicative of the relative quietness at a given location. It does not reflect the occurrence of transient and/or higher sound level events and is generally governed by continuous or semi-continuous sounds.

To ensure the background sound level values used within the assessment are reliable and suitably represent both the particular circumstance and periods of interest, efforts have been made to quantify a 'typical' background sound level for a given period. The purpose has not been to simply select the lowest measured value. Diurnal patterns have also been considered as they can have a major influence on background sound levels, for example, the middle of the night can be distinctly different (and potentially of lesser importance) compared to the start or end of the night-time period for sleep purposes.

Since the intention is to determine a background sound level in the absence of the specific sound that is under consideration, it is necessary to understand that the background sound level can in some circumstances legitimately include industrial and/or commercial sounds that are present as separate to the specific sound.

Assessment of Impact

BS4142:2014 states: "The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs". An estimation of the impact of the specific sound can be obtained by the difference of the rating sound level and the background sound level and considering the following:

- "Typically, the greater this difference, the greater the magnitude of the impact."
- "A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context."
- "A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context."
- "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 negligible impact, depending on the context."

Interpreting the guidance given in BS4142:2014, with consideration of the guidance given in the NPSE and NPPG Noise, an estimation of the impact of the rating sound is summarised in the following text:

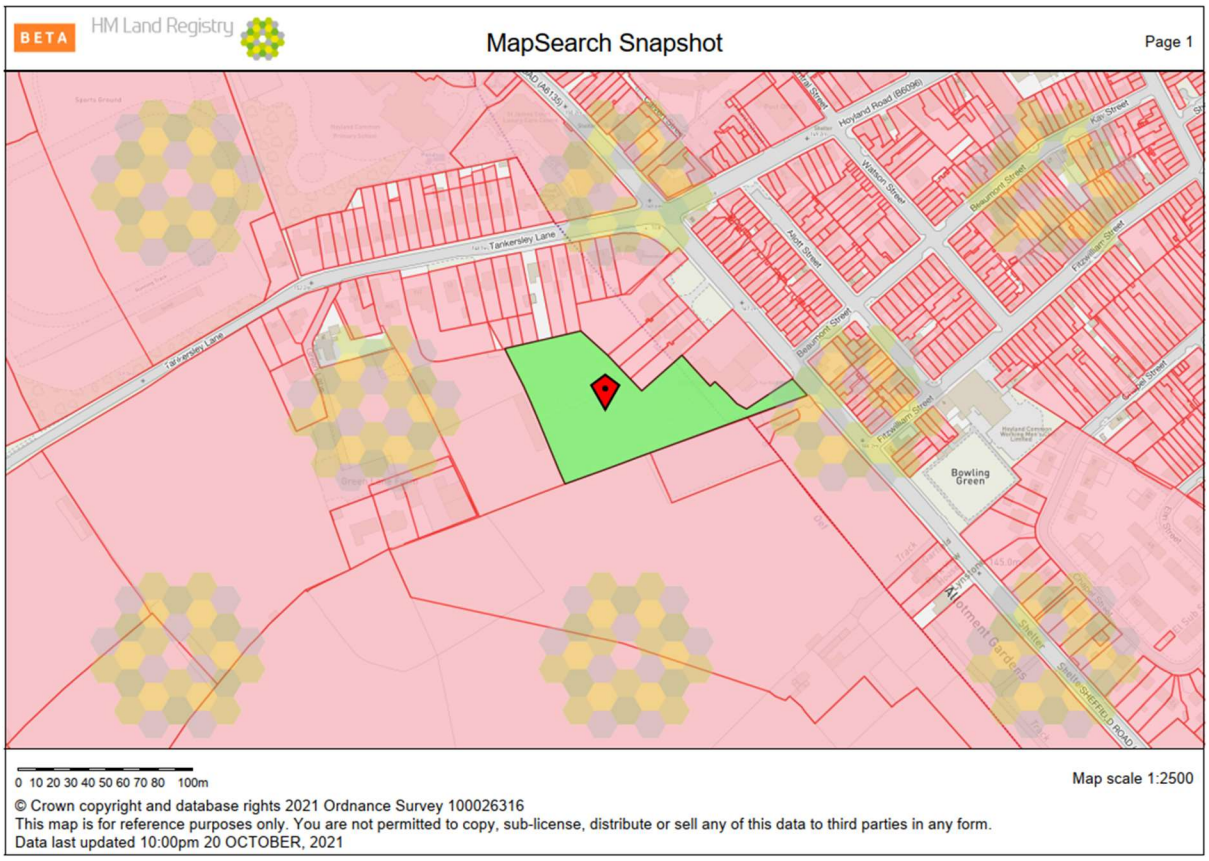
- A rating sound level that is +10 dB above the background sound level is likely to be an indication of a Significant Observed Adverse Effect Level.
- A rating sound level that is +5 dB above the background sound level is likely to be an indication of a Lowest Observed Adverse Effect Level.

- The lower the rating sound 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 sound level does not exceed the background sound level, this is an indication of the specific sound source having a negligible impact and would therefore classify as a No Observed Adverse Effect Level.

During the daytime, the assessment is carried out over a reference time period of 1-hour. The periods associated with day or night, for the purposes of the Standard, are 07.00 to 23.00 and 23.00 to 07.00, respectively.

Appendix C – Site Plans

Proposed Fence Location



Appendix D – Environmental Survey

D.1 – Tabulated Summary Noise Data

Measurement Position MP1				
Measurement Time Period ('t')	**$L_{Aeq,t}$**	**$L_{Amax,t}$**	**$L_{A90,t}$**	**$L_{A10,t}$**
Day 1 - 04/03/22: 14:00 – 23:00	61.0	85.0	58.0	63.0
Night 1 - 05/03/22: 23:00 – 04:45	58.0	83.0	57.0	58.0
L_{A90} Analysis				
Measurement Period ('t')	**$L_{A90,t}$**	**SMR $L_{A90,t}$**	**Min. $L_{A90,t}$**	**Max. $L_{A90,t}$**
Day 1 - 04/03/22: 14:00 – 23:00	58.0	60.0	52.0	61.0
Night 1 - 05/03/22: 23:00 – 04:45	51.0	50.0	46.0	54.0

Table 11.0 – Sound Survey Summary Results – MP1

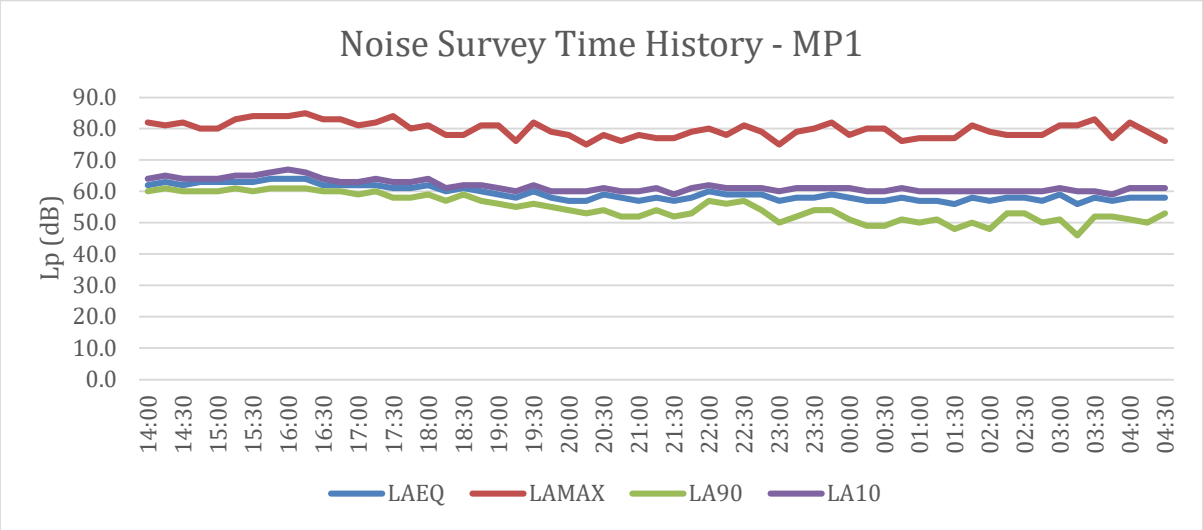


Figure 4.0 – Noise Survey Time History – MP1

D.2 – Surveying Equipment

Piece of Equipment	Serial No	Calibration Deviation
CESVA SC420 Class 1 Sound Level Meter	T244498	≤0.5
CESVA CB006 Class 1 Calibrator	901910	
CESVA SC250 Class 1 Sound Level Meter	T252915	≤0.5
CESVA CB011 Class 1 Calibrator	T251945	

Table 12.0 – Measurement Equipment

All equipment used during the survey was field calibrated at the start and end of the measurement period with a negligible deviation of ≤0.5 dB. All sound level meters are calibrated every 24 months and all calibrators are calibrated every 12 months, by a third-party calibration laboratory. All microphones were fitted with a protective windshield for the entire measurements period. Calibration certificates can be provided upon request.

D.3 – Meteorological Conditions

As the environmental noise survey was carried out over a long un-manned period no localised records of weather conditions were taken, however, all measurements have been compared with met office weather data of the area, specifically the closest weather station, and the data from the weather station is outlined in the table below. When reviewing the time history of the noise measurements, any scenarios that were considered potentially to be affected by the local weather conditions have been omitted. The analysis of the noise data includes statistical and percentile analysis and review of minimum and maximum values, which aids in the preclusion of any periods of undesirable weather conditions. The weather conditions were deemed suitable for the measurement of environmental noise in accordance with BS7445 Description and Measurement of Environmental Noise. The table below presents the average temperature, wind speed and rainfall range for each 24-hour period during the entire measurement.

Weather Conditions – Brettas Park – 5km North of Site				
Time Period	**Air Temp (^{0}C)**	**Rainfall (mm/h)**	**Prevailing Wind Direction**	**Wind Speed (m/s)**
04/03/22: 00:00 – 23:59	5.3 – 12.1	0.0 – 1.8	E	0.5 – 7.3
05/03/22: 00:00 – 23:59	8.9 – 11.4	0.0	E	0.6 – 6.7

Table 13.0 – Weather Summary