



Noise Impact Assessment

Site Address: 120 Rhosnesni Lane, Wrexham, LL12 7NB

Client Name: Blueprint Architectural Services

Project Reference No: NP-009463



Authorisation and Version Control

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Amendment History

Revision	Summary of Amendments
01	--

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Delivering sustainable development by promoting good health and well-being through effective management of noise.

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1. Introduction

NOVA Acoustics Ltd has been appointed to prepare a noise impact assessment for the proposed erection of 7 no. new industrial units ('the Proposed Development') at 120 Rhosnesni Lane, Wrexham, LL12 7NB ('the Site').

The applicant is preparing a planning application ('the Application') to be submitted to Wrexham County Borough Council in the hopes of being granted conditional approval. This technical report has been prepared for submission to the Local Planning Authority (LPA) to support the application and aims to positively influence the acoustic design of the scheme.

A baseline noise survey has been undertaken to establish the prevailing background sound levels at the closest Noise Sensitive Receptors ('NSRs'). The report details the existing background sound climate and the noise emissions associated with the Site. Measures required to mitigate noise impact have been recommended where necessary and assessed in accordance with the relevant performance standards, legislation, policy and guidance.

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

1.1 *Standards, Legislation, Policy & Guidance*

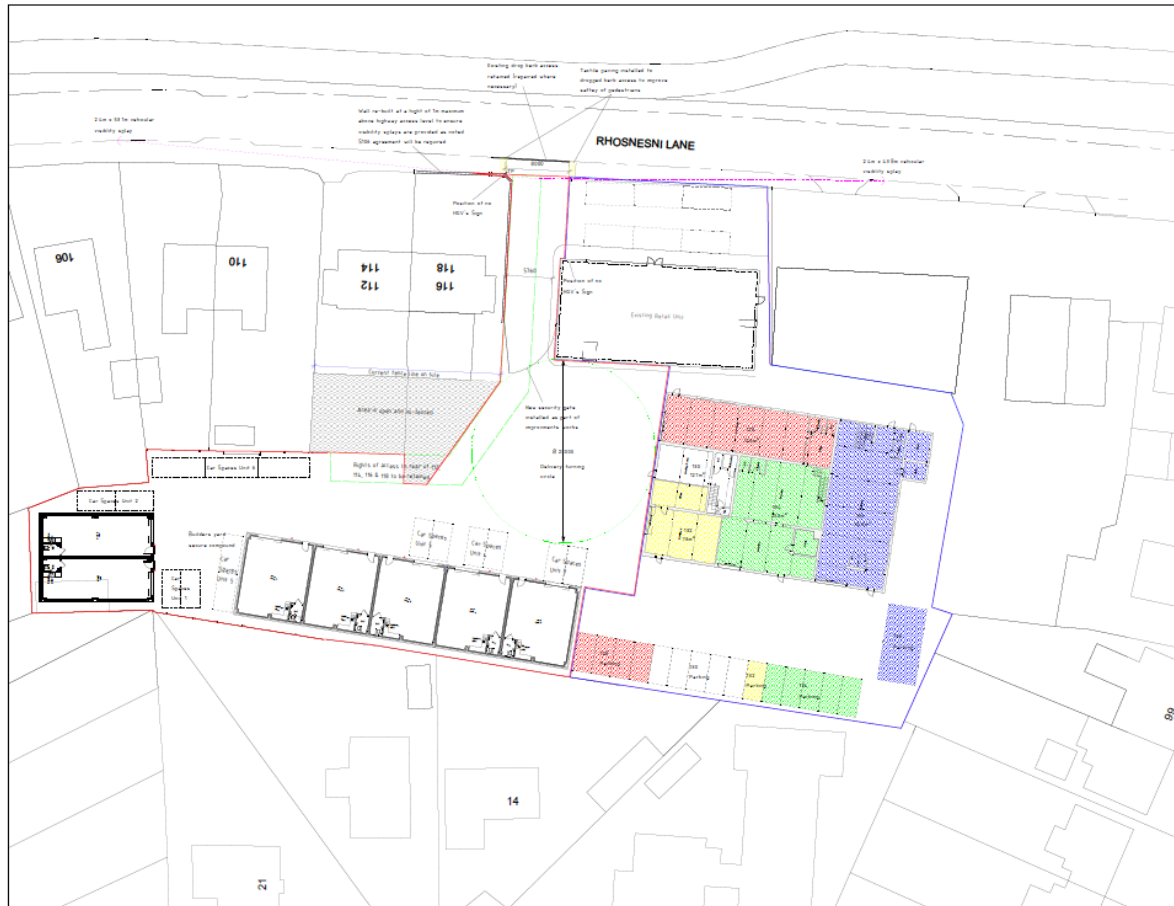
The following performance standards, legislation, policy and guidance have been considered to ensure good acoustic design in the assessment:

- The Local Planning Authorities Planning Documents, specifically: Wrexham County Borough Council's Local Planning Guidance Notes
- National Planning Policy Framework (2021)
- Planning Policy Wales, Edition 11, Adopted February 2021
- Town and Country Planning, Wales; The Town and Country Planning (Local Development Plan) (Wales) Regulations 2005
- Planning Guidance (Wales), Technical Advice Note (Wales) 11, Noise – October 1997
- BS4142:2014+A1:2019 – 'Methods for rating and assessing commercial and industrial sound'

Further information on the legislation can be found in Appendix B.

1.2 Background

The proposal is for the erection of seven new industrial units with associated parking, HGV turning circle and loading bays on an area of hardstanding that is currently used as a car park and a builder's yard. Figure 1 below presents the proposed site plan in relation to the immediate surrounding area.



Site Plan 1:250

Drawing Reference C139/006 Rev E (blueprint architectural services)

Figure 1 – Proposed Development

The end tenants for the units are unconfirmed at this stage. However, NOVA Acoustics has been informed that the intended usage will likely operate between 08:00 to 18:00. In addition, it is not likely that HGV movements will be frequently present at the site due to access issues along the access lane. Therefore, deliveries and vehicle movements will likely be limited to cars and Light Goods Vehicles (LGVs).

It is not known what plant, if any, will be installed within the units therefore a cumulative plant noise limit has been set for the development as a whole.

1.3 *Local Planning Authority*

Local Planning Authority guidance has been consulted to determine if Wrexham County Borough Council have any specific acoustic requirements for industrial developments of this nature and if they have a preferred approach more stringent than that requirements of BS4142.

Upon reviewing the Wrexham County Borough Council's Local Planning Guidance Notes, no specific policies relating to industrial or plant noise could be found. With that in mind, this assessment has been conducted in line with BS4142 and national policy guidance as the criteria.

2. Environmental Noise Survey

2.1 Measurement Methodology

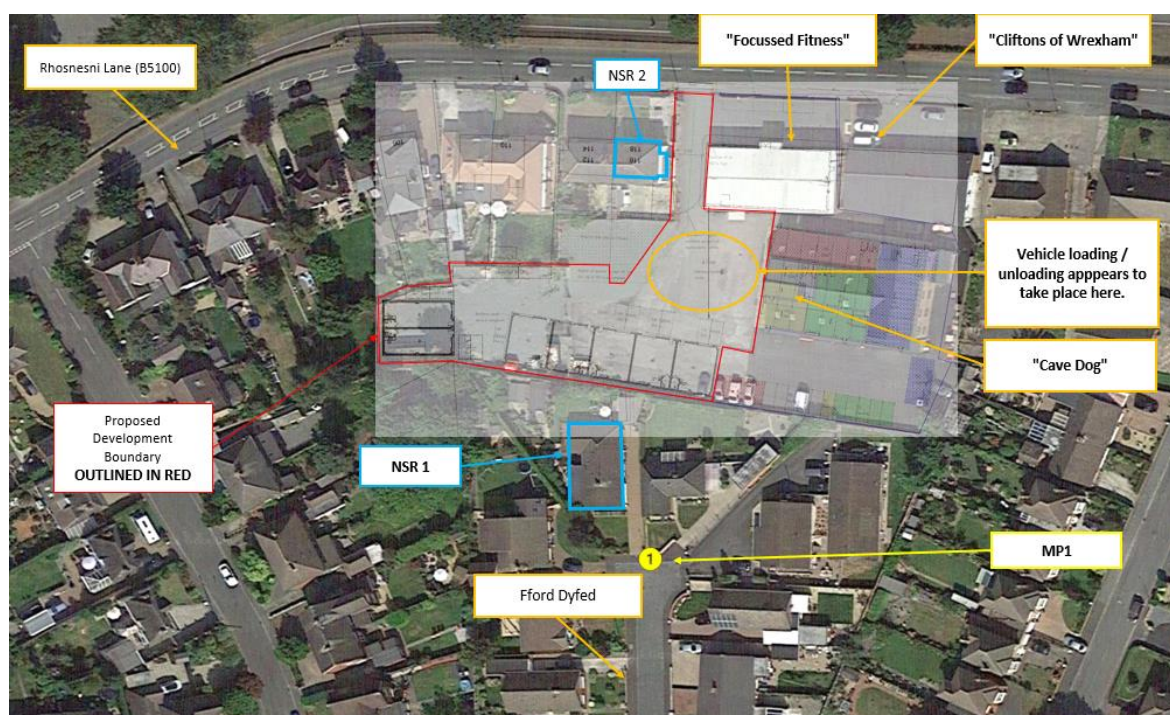
To better understand the acoustic context of the site and establish the existing background sound levels, unattended long-term baseline noise monitoring was undertaken between the 1st - 4th June 2023. The following table outlines the measurement positions and particulars.

Figure 2 below illustrates the approximate measurement positions in relation to the site and the nearest Noise Sensitive Receptors (NSRs). The following table outlines the measurement dates and particulars.

Location	Survey Dates	Measurement Particulars
MP1	01/06/2023 – 04/02/2023	Equipment affixed to a lamppost 4m above ground in free-field conditions. Position is approximately 35m south of the development site.

Table 1 – Measurement Methodology

The figure below outlines the site surroundings and measurement locations:



Imagery ©2023 Infoterra Ltd & Bluesky, Maxar Technologies, The GeoInformation Group, Map data ©2023

Figure 2 – Measurement Locations and Site Surroundings

2.2 Context & Subjective Impression

The proposed development site is located between the residential suburbs of Acton and Rhosnesni in the Welsh town of Wrexham. The surrounding area is characterised as being primarily residential, with residential properties bound to the north, south and west of the site. The site access opens onto the B5100 Carriageway (Rhosnesni Lane) which runs parallel with the site and is understood to be a

distributor road with relatively low traffic volumes. Further beyond Rhosnesni Road to the north is a large playing field with two grass football fields.

Immediately to the east of the site are three commercial premises occupied by “Cliftons of Wrexham Ltd”, “Cave Dog”, and “Focused Fitness Training Centre”. These premises operate between the hours of 08:30 – 16:00 Monday – Friday, 11:00 – 16:00 Monday – Saturday, and 06:00 – 20:00 weekdays and weekends respectively. It was observed whilst on site that deliveries take place both by the front of these units and within proposed development site boundary to the rear / east. Other than deliveries, no other commercial activity or plant noise was audible.

The acoustic environment on site was dominated by occasional road traffic on the B5100, local birdsong and foliage movements.

A number of NSRs have been identified, with those considered to be the most exposed and susceptible to the proposals outline in Table 2 below. In addition, these NSRs have been outlined in Figure 2 on the previous page.

Identifier	Description and Location	Approx. Distance from Site m*
NSR1	Residential Bungalow – 23 Ffordd Dyfed, Wrexham, LL12 7EF	11
NSR2	Residential House – 116 Rhosnesni Lane, Wrexham, LL12 7NB	31

Note *: As measured from the residential façade to the closest façade of the proposed industrial units.

Table 2 – Nearest NSRs

2.3 Environmental Noise Survey Results

Background Sound Level Analysis

The following section outlines the measured background sound levels that have been used as the baseline for the subsequent BS4142 noise assessment. A summary of the measured noise levels is presented in Table 3, below, for the core operational hours during and the night-time period.

The complete time history results and background histograms can be found in Appendix C.

Position	Period	Average $L_{Aeq,T}$ (dB)	Background $L_{A90,T}$ (dB)
MP1	Core Operational Hours: 08:00 – 18:00	52	38
	Night: 23:00 – 07:00	42	32

Table 3 – MP1 Operational Hours Background Sound Level Analysis

The background sound level has been determined using statistical analysis of the modal $L_{A90,T}$ values. As presented in the table above, the background sound levels of 38dB and 32dB have been used to inform the assessment, in line with BS4142 methodology.

3. Noise Impact Assessment

In the following section of the report, the impact of the noise emissions generated by the Proposed Development is assessed.

As there is a high degree of uncertainty regarding the end use, operational times, the tenants and any additional plant supplied by the tenants for some of the units, noise limits have been set to ensure that the acoustic environment remains protected.

Noise emitting from the site could take multiple forms, therefore this assessment considers noise arising from vehicle movements, deliveries, noise breaking out of the building fabric, and fixed plant noise. In addition, individual fixed plant noise limits have been set for each individual unit to ensure that the overall cumulative plant noise limit can be achieved.

Calculations at this stage are purely indicative due to the level of uncertainty and have naturally been undertaken in a more conservative manner. The assessment is predominantly based off reasonable assumptions and reference sound levels taken from both industry guidance and previous project experience.

3.1 Deliveries and Vehicle Movements

As the end tenants are unknown, there is a high degree of uncertainty regarding the exact number of on-site vehicle movements and deliveries at the proposed development. Taking into account the proposed size of the units, it has been estimated that a realistic worst-case of 14 no. deliveries at the site per hour (i.e. 2 no. deliveries per unit).

Based on a speed limit of 5mph, it is predicted that on average a one-way movement to one of the units would take approximately 35 seconds to complete. Deliveries have been assumed to be undertaken by LGVs and therefore loading and unloading activities are anticipated to be completed manually. For the purposes of the assessment, it has been assumed that delivery vehicles will spend a maximum duration of 1-minute idling outside the roller shutter doors of the associated unit.

3.2 Specific Sound Levels & Noise Modelling Parameters

Noise breakout through the external façade and vehicle movements have been modelled within SoundPlan 9.0 software. The table below outlines the 1/1 octave frequency band sound levels of each noise source that have been inputted into the noise model.

Description	1/1 Octave Frequency Band (Hz, dB)								Overall (dBA)
	63	125	250	500	1k	2k	4k	8k	
LGV in transit (L_p at 2.5m)	72	74	64	59	58	55	50	43	64
LGV idling (L_p at 2.5m)	64	62	58	55	55	52	47	44	59
Internal sound pressure level within small industrial unit (L_p)	72	72	72	74	76	71	68	63	79

Table 4 – Sound Levels Used within the Assessment

The sound levels stated in Table 4 are sourced from measured data from previous project experience of a similar scale and are deemed to be appropriate for this type of development.

The following assumptions have been made within the SoundPlan 9.0 noise modelling software:

- The proposed development has been modelled in accordance with Drawings provided by the Client, Google Map Imagery and measurements taken on-site.
- Average ground absorption within the model has been set to 0.6 for ground that is neither acoustically hard nor soft. Any areas of significant soft ground or hardstanding have been inputted separately with absorption coefficients of 1.0 and 0.0 respectively.
- Calculations in line with ISO 9613-2 assessment methodology.
- Façade reflection loss of 1dB.
- Maximum second order reflections.
- On-site speed limit of 5mph.
- LGV source height of 0.5m.
- Receiver height of 1.5m for ground floor receptors and 4m for first floor receptors.
- It has been assumed that the external envelope of the industrial units provides at least 35dB sound reduction.
- A -5dB correction has been applied to noise breakout through the façade to account for the change in diffusivity.

3.3 BS4142 Noise Impact Assessment

The noise modelling outputs are presented in the below figure.

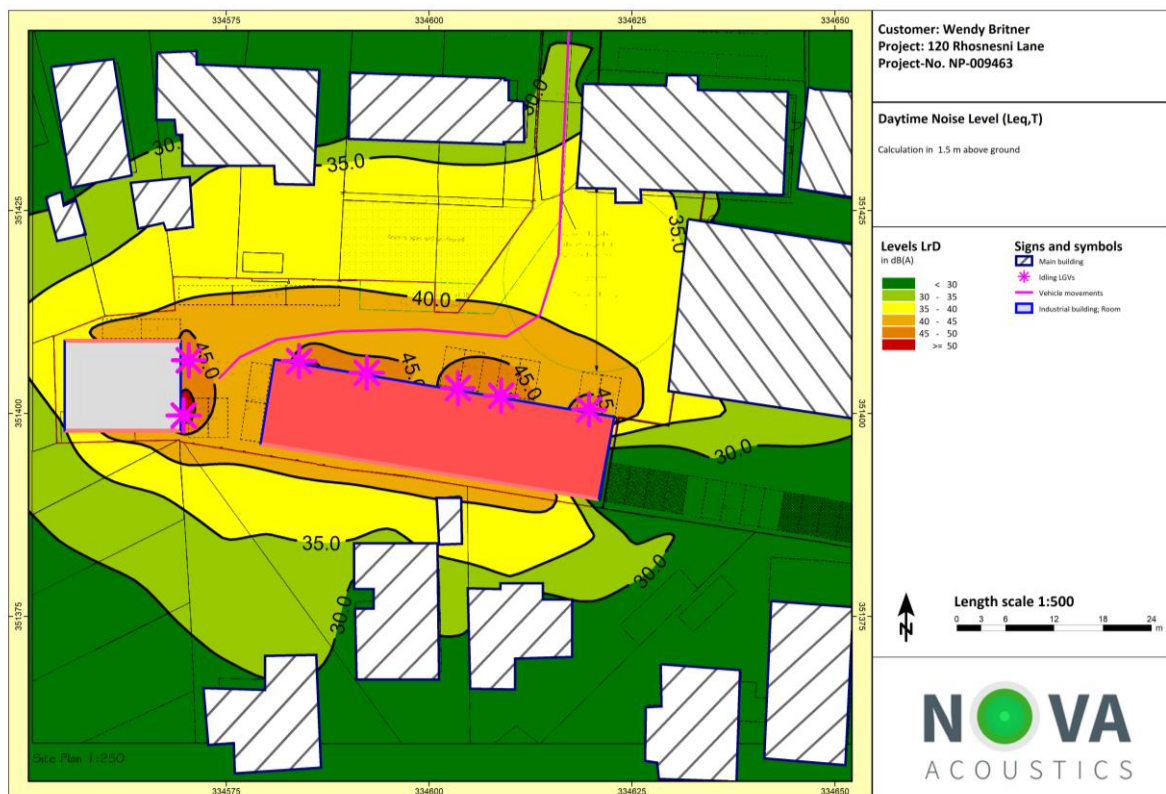


Figure 3 – Noise Modelling Outputs

The rating level as calculated using BS4142 has been predicted 1m from the nearest NSR façades, the results of which are outlined in Table 5. These levels exclude any contribution from fixed plant.

A correction of +3dB is included in the rating level to account for any potential characteristics that are readily distinctive against the residual acoustic environment.

Receptor	Period	Existing $L_{A90,T}$ dB	Specific Level L_p dB	Rating Level $L_{A,r,Tr}$ dB	Difference
NSR 1	Core Operational Hours: 08:00 – 18:00	38	35	38	0
NSR 2		38	35	38	0

Table 5 – Indicative Rating Level Predictions

The above figures are based on a reasonable worst-case level as measured during any given 1-hour period during the core operational hours. It is likely that there will be large periods where there will significantly less deliveries and vehicle movements, therefore the overall average rating level over the entire operational period would likely be lower.

As can be seen from Table 5, the rating level is not anticipated to exceed the background sound level based on the assumptions made. This is a positive indication of a negligible impact and is in line with the No Observed Effect Level (NOEL) threshold stated in NPPF. However, this is heavily dependent on light-industrial usage at the site with no significant requirements for deliveries and vehicle movements.

3.4 Fixed Plant Noise Limits

In the interest of protecting the nearest NSRs and the local sound scape, it is recommended that the cumulative specific level from fixed plant servicing the proposed development does not exceed 25dBA during the daytime or night-time at the nearest NSRs. This level should be low enough to not cumulatively add to the specific sound level associated with vehicle movements during the daytime and will result in a low likelihood of adverse impact during the night-time, if required.

Fixed plant noise limits are applicable to both generic plant installed as part of the core building and any future tenant plant. It is recommended that should any future tenants wish to add their own fixed plant that the tenant undertakes their own noise impact assessment to ensure that the rating level at the nearest NSR does not exceed the existing background as stated within this report.

Fixed plant with higher noise emissions can be installed providing that after suitable attenuation the total fixed plant noise limit per unit is not exceeded.

Providing these limits are adhered to, the rating level from fixed plant, deliveries, and noise breakout through the external façade of the units is not expected to exceed the measured background sound level at the nearest NSRs, inclusive of a +3dB acoustic characteristic penalty. According to BS4142, this is a positive indication of a negligible impact.

4. Recommendations & Mitigation Measures

In the following section, the recommendations and mitigation measures required to reduce the noise impact from the Proposed Development are defined.

In line with good acoustic practice, all plant should be regularly serviced and properly maintained. Fixed plant should be suitably vibration isolated and installed as per manufactures instructions.

As the units are mostly surrounded by residential receptors, it is recommended that any external openings in the façade remain closed except when in use, with primary ingress and egress points positioned on the most sympathetic façade to the surrounding noise sensitive receptors. Where possible, plant should be positioned to avoid a direct line of sight to the nearest NSR.

Vehicles should turn off their engines when not required and the use of reversing alarms and shouting outside should be limited where possible, especially during the more sensitive operational hours.

It should be noted that as some of the finite detail for the proposals are unknown at this stage, this report is speculative and is based on reasonable worst-case assumptions given the proposed units size and scale. Should the proposals change, or more definitive details arise that indicate an intensification above what has been assumed, this assessment should be revised with the latest drawings and information.

5. Conclusion and Action Plan

The proposed development has been assessed against the requirements of BS4142 and the LPA's policies and guidance, and a mitigation scheme has been provided to reduce the noise impact from the site.

Based on the assumptions outlined in this report, the BS4142 assessment of proposals indicate that the cumulative rating level at the nearest NSR from fixed plant, deliveries and breakout through the external façade is not expected to exceed the measured background sound level of 38dB during the core daytime operational hours; inclusive of a +3dB acoustic characteristic penalty. In line with BS4142, this is a positive indication of a negligible impact. In addition, the context of the area should be considered as the existing site is currently used for deliveries and car parking for the neighbouring commercial units.

This is an indication of a low impact, dependent on context, which is classed as 'No Observed Adverse Effect Level' ('NOAEL') when assessed in accordance with the NPSE and NPPF.

The following 'Action Plan' is outlined to ensure the design considerations and specifications from this report are duly implemented:

1. The fixed plant noise limits outlined in Section 3.4 should be adhered to. Where fixed plant is likely to exceed the fixed plant noise limits, acoustic attenuation must be installed to ensure that the cumulative rating level at the nearest NSR does not exceed the existing background level.
2. The external façade of the units should provide upwards of 35dB R_w sound reduction via the sound insulation scheme.
3. In addition to the recommendations specified in Section 4, the following best working practices should also be implemented:
 - a. Plant should be used in accordance with the manufacturer's recommendations.
 - b. Plant which may be used intermittently should be shut down between work periods.
 - c. Plant and machinery should be properly maintained and regularly serviced, with particular greasing applied to any bearings.
 - d. Vehicles should turn off their engines when not in use and reversing alarms should be limited where possible, especially during the more sensitive operational hours.

It should again be stressed that the end clients and the exact terms of use of these units is unknown at this stage, therefore this assessment is speculative and is a demonstration that the site can be suitable for the intended use. If once more definitive details are decided it is apparent that this acoustic assessment is no longer representative, the assessment should be revised with the most recent drawings and information available at that time.

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

Appendix A – Acoustic Terminology

A-weighted sound pressure level, L_{pA}	Quantity of A-weighted sound pressure given by the following formula in decibels (dBA). $L_{pA} = 10 \log_{10} (pA/p_0)^2$. Where: pA is the A-weighted sound pressure in pascals (Pa) and p_0 is the reference sound pressure (20 μ Pa)
Background Sound	Underlying level of sound over a period, T , which might in part be an indication of relative quietness at a given location
Equivalent continuous A-weighted sound pressure level, $L_{Aeq,T}$	Value of the A-weighted sound pressure level in decibels (dB) of a continuous, steady sound that, within a specified time interval, T , has the same mean-squared sound pressure as the sound under consideration that varies with time
Facade level	Sound pressure level 1 m in front of the facade
Free-field level	Sound pressure level away from reflecting surfaces
Indoor ambient noise	Noise in a given situation at a given time, usually composed of noise from many sources, inside and outside the building, but excluding noise from activities of the occupants
Noise Criteria	Numerical indices used to define design goals in a given space
Noise Rating (NR)	Graphical method for rating a noise by comparing the noise spectrum with a family of noise rating curves
Octave Band	Band of frequencies in which the upper limit of the band is twice the frequency of the lower limit
Percentile Level, $L_{AN,T}$	A-weighted sound pressure level obtained using time-weighting “F”, which is exceeded for $N\%$ of a specified time interval
Rating Level, $L_{Ar,Tr}$	Equivalent continuous A-weighted sound pressure level of the noise, plus any adjustment for the characteristic features of the noise
Sound Pressure, p	root-mean-square value of the variation in air pressure, measured in pascals (Pa) above and below atmospheric pressure, caused by the sound
Sound Pressure Level, L_p	Quantity of sound pressure, in decibels (dB), given by the formula: $L_p = 10 \log_{10} (p/p_0)^2$. Where: p is the root-mean-square sound pressure in pascals (Pa) and p_0 is the reference sound pressure (20 μ Pa)
Weighted sound reduction index, R_w	Single-number quantity which characterizes the airborne sound insulating properties of a material or building element over a range of frequencies

Appendix B – Standards, Legislation, Policy, and Guidance

This report is to be primarily based on the following standards, 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 – BS4142:2014+A1:2019 – ‘Methods for rating and assessing industrial and commercial sound’

Overview

BS4142 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 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 $L_{A,r,Tr}$ '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 describes how the rating sound level should be derived from the specific sound level, by deriving a rating penalty.

BS4142 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, 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 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 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 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 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 low impact, depending on the context."

Interpreting the guidance given in BS4142, 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 +10dB above the background sound level is likely to be an indication of a Significant Observed Adverse Effect Level;
- A rating sound level that is +5dB 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 low impact and would therefore classified as 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 – Environmental Survey

C.1 – Time History Noise Data

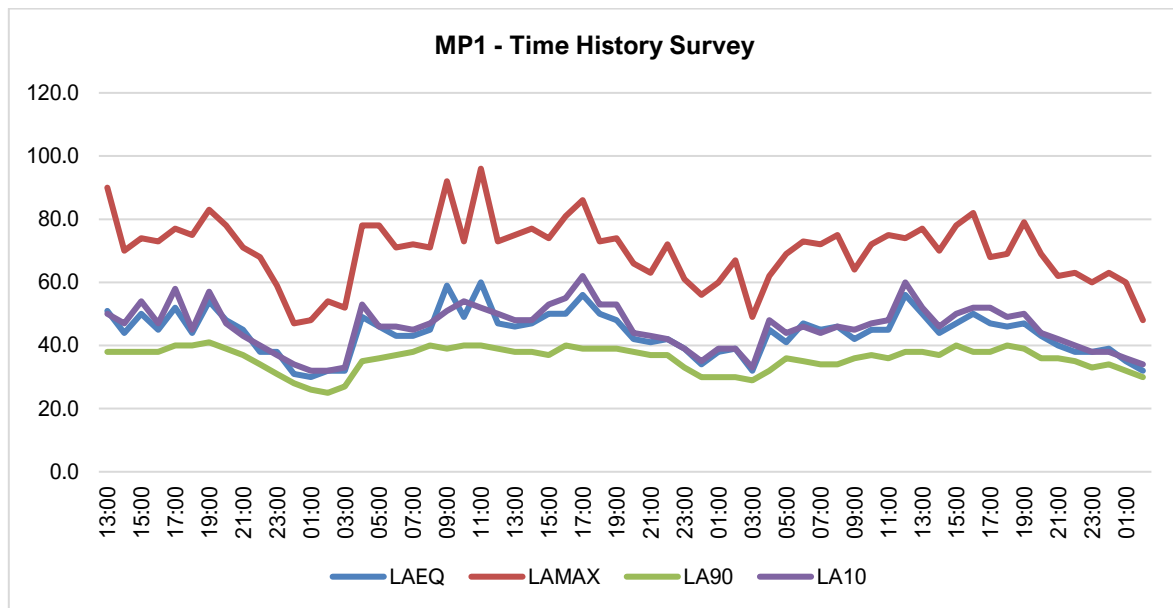


Figure 4 – MP1 Noise Survey Time History

C.2 – Background Histograms

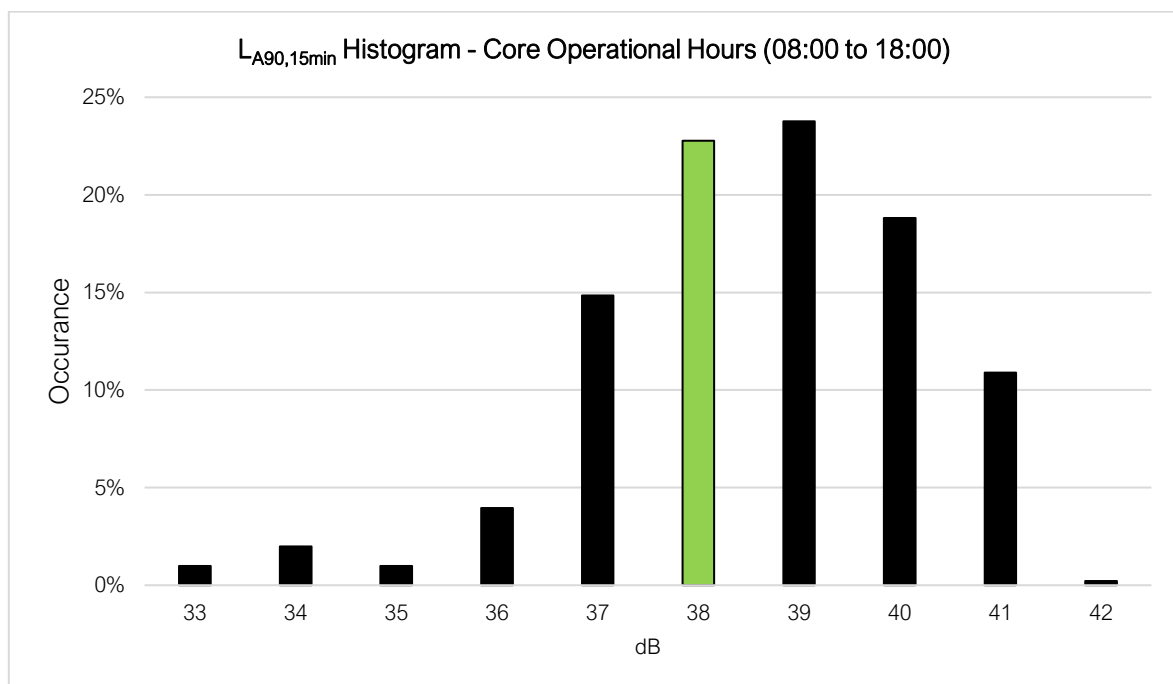


Figure 5 – MP1 Background Histogram – Core Operational Hours

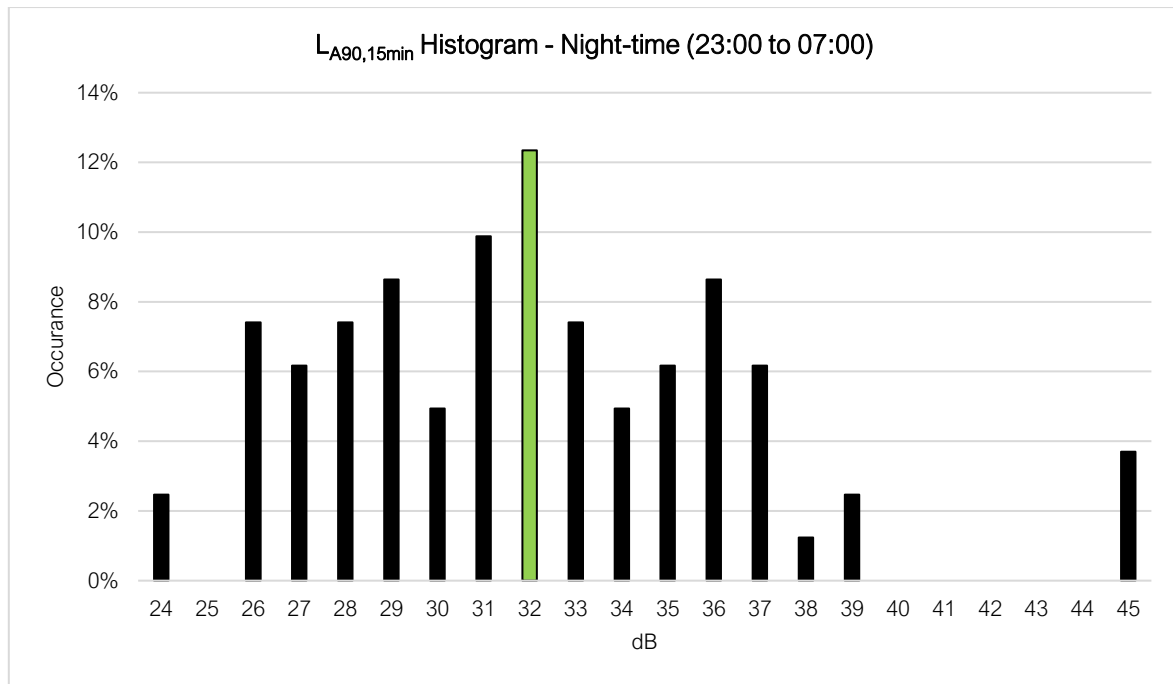


Figure 6 – MP1 Background Histogram – Night-time

C.3 – Surveying Equipment

Piece of Equipment	Serial No.	Calibration Deviation
CESVA SC420 Class 1 Sound Level Meter	T250681	≤0.2
CESVA CB006 Class 1 Calibrator	902442	

Table 6 – Surveying Equipment

All equipment used during the survey was field calibrated at the start and end of the measurement period with negligible deviation noted. 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.

C.4 – 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 – Broughton Observation Site (Approx. 11km N of Site)				
Time Period	Air Temp (°C)	Rainfall (mm/h)	Prevailing Wind Direction	Wind Speed (m/s)
01/06/23 – 00:00 – 23:59	9.6 – 27.2	0	W	0.0 - 1.3
02/06/23 – 00:00 – 23:59	11.6 – 27.4	0	W	0.0 – 1.8
03/06/23 – 00:00 – 23:59	7.7 – 29.2	0	WSW	0.0 – 1.8
04/06/23 – 00:00 – 23:59	8.6 – 29.3	0	W	0.0 – 1.3

Table 7 – Weather Conditions

**Wind speeds of less than 5 m/s were recorded on-site during the attended surveying. Equipment was fitted with its proprietary environmental kit, including a windshield 130mm in diameter which is efficient up to 8 m/s (according to manufacturer's data sheets).*



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