



Noise Impact Assessment of No. 2 Industrial Units.

Client: Pavetec Solutions

Address: 10 Spring Vale Street,
Tottington,
Greater Manchester
BL8 3LR

Date: 01/04/2020



Version	1	2	3
Authored By	Mr C Lopez, BEng		
Approved By	A T Martin MSc, MIOA, MIET, MInstSCE	--	--
Date	01/04/2020	--	--
Project Number	4377PS	--	--

Disclaimer

The opinions and interpretations presented in this report represent our best technical interpretation of the data made available to us. However, due to uncertainty inherent in the estimation of all parameters, we cannot, and do not guarantee the accuracy or correctness of any interpretation and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, cost, damages or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. The findings and opinions expressed are relevant to the dates of the site works and should not be relied upon to represent conditions at substantially later dates. If additional information becomes available which may affect our comments, conclusions or recommendations, the author reserves the right to review the information, reassess any new potential concerns and modify our opinions accordingly.

Except for the provision of professional services on a fee basis, NOVA Acoustics Ltd does not have a commercial arrangement with any person or company involved in the interests that are the subject of this report. NOVA Acoustics Ltd cannot accept any liability for the correctness, applicability or validity for the information they have provided, or indeed for any consequential costs or losses in this regard. Our efforts have been made on a "best endeavors" basis and no responsibility or liability is warranted or accepted by NOVA Acoustics Ltd.

Copyright ©

The material presented within this report is confidential. This report has been prepared for the exclusive use of the client and shall not be distributed or made available to any other company or person without the knowledge and written consent of NOVA Acoustics Ltd and the client. All works undertaken by NOVA Acoustics Ltd are carried out in accordance with NOVA Acoustics Ltd's terms and conditions found at www.novaacoustics.co.uk.

Contents

EXECUTIVE SUMMARY	5
1. INTRODUCTION.....	6
1.1. Overview.....	6
1.2. Scope & Objectives.....	6
1.3. Legislation, Policy and Guidance.....	6
2. SITE DESCRIPTION & BACKGROUND INFORMATION	7
2.1. Site & Surroundings.....	7
2.2. Background	7
3. ENVIRONMENTAL NOISE SURVEY.....	8
3.1. Measurement Methodology	8
3.2. Measurement Equipment.....	8
3.3. Weather Summary	8
3.4. Results.....	9
3.5. Subjective impression & Context	10
3.6. Uncertainty.....	10
4. NOISE ASSESSMENT	12
4.1. BS4142:2014 – Internal Breakout Assessment.....	12
4.2. Increase in Ambient Noise Level Assessment	14
4.3. Recommendations and Mitigation	15
APPENDIX A – ACOUSTIC TERMINOLOGY.....	17
APPENDIX B – LEGISLATION, POLICY AND GUIDANCE	20
APPENDIX C - LOCATION PLAN	24
APPENDIX D – SITE PLANS	25
APPENDIX E – ENVIRONMENTAL SOUND SURVEY	26
APPENDIX F – TECHNICAL DATASHEET	27

Tables

<i>Table 1.0 – Measurement Equipment.....</i>	<i>8</i>
<i>Table 2.0 - Meteorological Data</i>	<i>9</i>
<i>Table 3.0 – Sound Survey Summary Results</i>	<i>9</i>
<i>Table 4.0 – Sound Survey Summary Results – Operational times.....</i>	<i>9</i>
<i>Table 5.0 – Background Sound Level Summary Results</i>	<i>9</i>
<i>Table 6.0 – Background Sound Level Summary Results</i>	<i>10</i>
<i>Table 7.0 – Breakout Calculations</i>	<i>12</i>
<i>Table 8.0 – Specific Sound Level at NSR Summary.....</i>	<i>13</i>
<i>Table 9.0 – Rating Penalty Assessment</i>	<i>13</i>
<i>Table 10.0 – Specific Sound Level at NSR Summary.....</i>	<i>14</i>
<i>Table 11.0 – BS4142:2014 Assessment</i>	<i>14</i>
<i>Table 12.0 –Increase in Ambient Noise Level Assessment</i>	<i>15</i>
<i>Table 13.0 – Increase in Ambient Noise Level Assessment</i>	<i>16</i>
<i>Table 14.0 – IEMA Guidelines effect descriptors</i>	<i>22</i>
<i>Table 15.0 – IEMA Guidelines noise effect level.....</i>	<i>22</i>

Figures

<i>Figure 1.0 - Site Development and NSR's.....</i>	<i>7</i>
<i>Figure 2.0 – Specific Sound Level Map of Internal Breakout.....</i>	<i>13</i>
<i>Figure 3.0 – Specific Sound Level Map of Internal Breakout with the Recommended Mitigation. ..</i>	<i>16</i>



Executive summary

An environmental noise survey and noise impact assessment have been undertaken at 10 Spring Vale Street, Tottingham, Bury, BL8 3LR, to assess the potential increase in noise levels from the erection of 2 No. light industrial units, on the surrounding Noise-Sensitive Receptors (NSRs). The measured noise background sound levels have allowed a BS4142:2014 and an ambient increase in noise level assessment to be carried out.

The BS4142 assessment has shown that the predicted noise emissions due to noise breakout of the units are predicted to cause an 'Significant Adverse Impact, depending on the context' the rating noise level is above 14.0 dB above the background sound level. This is classed as SOAEL (Significant Observed Adverse Effect Level) when assessed in accordance with the NPSE and NPPF. Therefore, further mitigation and recommendations are presented in Section 4.3 of this report.

However, should the recommendation be implemented we would expect the Rating Sound Level from the noise emission during the proposed operational hours to be 40.0 dB. Therefore, it will fall a minimum of 3.0 dB below the lowest $L_{A90,15min}$, indicating thus "Negligible Adverse Impact, depending on the context" when assessing in accordance with BS4142:2014. This is classed as NOEL (No Observed Effect Level) when assessed in accordance with the NPSE and NPPF.

An IEMA 'Increase in Ambient Noise Level' assessment has shown that the cumulative noise emissions from the Proposed Development are predicted to increase the ambient noise level at the NSRs by approximately 2.0 dB. When assessed in accordance with the IEMA Guidelines on noise impact this is considered a 'Not Significant' increase. Further 'Increase in Ambient Noise Level' assessment has been undertaken once the proposed mitigations have been implemented and ambient noise level is expected to be increased by 0.0 dB, which is considered as 'None'.

An overview of the recommendation section is shown below:

Recommendation and Mitigation Section.

- The operational hours should not exceed 08:00 – 17:00 Monday to Friday.
- All doors and or shutters should remain closed during operational hours.
- Upgrade the shed panelling to provide a minimum sound reduction of 40 dB R_w . An example of adequate solution can be a pre-finished steel cladding system from TATA STEEL. See technical data within Appendix F.

1. Introduction

1.1. Overview

NOVA Acoustics Ltd has been commissioned to prepare a noise impact assessment for the removal of existing buildings and erection of two units with first floor offices (Class B1) and associated car park ('the Proposed Development') at 10 Spring Vale street, Tottington, Bury, BL8 3LR ('the Site').

The Applicant is preparing a planning application to be submitted ('the Application') to Bury Metropolitan Borough Council.

Accordingly, the following technical noise assessment has been produced to accompany the Application to Bury Metropolitan Borough Council.

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.

1.2. Scope & Objectives

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

- Baseline sound monitoring survey to evaluate the prevailing sound levels at the nearest sensitive receptor ('NSR') to Site;
- Detailed sound modelling, acoustic calculation and analysis in accordance with ISO9613 – 1 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 Practice Guidance in England and Wales, BS4142:2014 and other relevant standards.

1.3. Legislation, Policy and Guidance

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

- National Planning Policy Framework (2019)
- Noise Policy Statement for England
- IEMA Guidelines on Noise Impact Assessments
- BS 4142:2014
- ISO 9613-2 Attenuation of sound during propagation outdoors
- BS EN 12354-4 Building Acoustics

2. Site Description & Background Information

2.1. Site & Surroundings

The proposed development is surrounded by residential and commercial premises. The closest residential area is adjacent to the north of the proposed site. Adjacent to south of the site runs Spring Vale Street, with low traffic levels. To the east, approximately 20m away, runs Market with moderate traffic flow levels. To the east, south and west of the site can be found commercial/industrial developments such as an auto repair shop "Heenans Village Garage", which operates Monday to Friday from 08:30 to 17:00 and Saturday from 08:30 to 14:00, "BLS Autos" which operates from Monday to Saturday from 08:00 to 17:00 and "The Re-Upholstery Specialists" which operates Monday to Friday from 08:00 to 16:00 and Saturday from 09:00 to 16:00. To North East, along Market Street, are located some commercial and residential developments. Due to their proximity, the residential dwellings located at the rear of the site are considered as Noise Sensitive Receptors (NSR) in the subsequent assessment.



Figure 1.0 - Site Development and NSR's

2.2. Background

The existing buildings are proposed to be demolished in order to erect two new industrial units with offices (B1) at first floor and associated car park. The industrial units will be used as storage of tool and materials. The Proposed Development will operate from 08:00 to 17:00. The client has stated that there will be no HGV movements and that there is no external plant associated to the development.

3. Environmental Noise Survey

In order to characterise the sound profile of the area of the proposed development, a long term 24-hour environmental sound survey was carried out from the 11st June 2020 to 12th June 2020.

3.1. Measurement Methodology

For the long term sound monitoring, the sound level meter was placed at a lamppost. The microphone was installed approximately 3.5m from the ground and more than 3m from any other reflective surface. The monitoring position was chosen in order to collect representative sound levels of the area during the week, day time and night time periods. This position was also representative of the sound levels at the NSR. The measurement position can be found in Figure 1.0.

3.2. Measurement Equipment

Piece of Equipment	Serial No	Calibration Deviation
CESVA SC420 Class 1 Sound level meter	T246452	≤0.5
CESVA CB006 Class 1 Calibrator	901997	

Table 1.0 – Measurement Equipment

All equipment used during the survey was field calibrated at the start and end of the measurement period with 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 wind shield for the entire measurements period. Calibration certificates can be provided upon request.

3.3. Weather Summary

As the environmental noise survey was carried out over a long un-manned period no localized records of weather conditions were taken. However, during the set up and collection of the monitoring equipment the weather conditions have been documented in the following table. All measurements have been compared with met office weather data of the area, specifically the closest weather station is at Holcombe Village, Ramsbottom 12Km distance away. 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 22/01/2019 – 25/01/2019 – Holcombe Village				
Time period	Air temp (°C)	Rainfall mm/h	Prevailing Wind Direction	Wind Speed (m/s)
11/03/2020 00:00– 23:59	1.4 – 10.4	0.0 – 7.1	S	0.0 – 3.3

12/03/2020 00:00 – 23:59	1.2 – 8.8	0.0 – 1.3	SSE	0.0 – 3.0
--------------------------	-----------	-----------	-----	-----------

Table 2.0 - Meteorological Data

3.4. Results

1.1.1. Summary Results

The following table shows a summary of the sound survey results; L_{Aeq} , L_{Amax} , L_{A90} and the L_{A10} for the measurement period.

Measurement Position MP1				
Measurement Time Period ('t')	$L_{Aeq,t}$	$L_{Amax,t}$	$L_{A90,t}$	$L_{A10,t}$
Day 1 - 11/03/20 - 09:55 - 23:00	54.0	86.0	48.0	55.0
Night 1 - 11/03/20 - 23:00 - 07:00	55.0	83.0	51.0	57.0
Day 2 - 12/03/20 - 07:00 - 10:30	57.0	90.0	48.0	60.0

Table 3.0 – Sound Survey Summary Results

The following table shows a summary of the sound survey results; L_{Aeq} , L_{Amax} , L_{A90} and the L_{A10} for the hour before and after of the operational hours.

Measurement Position MP1				
Measurement Time Period ('t')	$L_{Aeq,t}$	$L_{Amax,t}$	$L_{A90,t}$	$L_{A10,t}$
Day 1 - 11/03/20 - 10:15 - 17:00	52.0	83.0	48.0	54.0
Day 2 - 12/03/20 - 08:00 - 10:15	54.0	90.0	49.0	56.0

Table 4.0 – Sound Survey Summary Results – Operational times

1.1.2. Background Sound Level Summary Results

The following table shows a summary of the background sound level results during the measurement period.

Measurement Position MP1				
Measurement Period ('t')	$L_{A90,t}$	Statistically most Repeated $L_{A90,t}$	Min. $L_{A90,t}$	Max. $L_{A90,t}$
Day 1 - 11/03/20 - 09:55 - 23:00	48.0	43.0	43.0	54.0
Night 1 - 11/03/20 - 23:00 - 07:00	44.0	43.0	41.0	49.0
Day 2 - 12/03/20 - 07:00 - 10:30	46.0	46.0	44.0	47.0

Table 5.0 – Background Sound Level Summary Results

The following table shows a summary of the background sound level results during the operational times.

Measurement Position MP1				
Measurement Period ('t')	L _{A90,t}	Statistically most Repeated L _{A90,t}	Min. L _{A90,t}	Max. L _{A90,t}
Day 1 - 11/03/20 - 10:15 - 17:00	48.0	43.0	43.0	52.0
Day 2 - 12/03/20 - 08:00 - 10:15	46.0	46.0	44.0	46.0

Table 6.0 – Background Sound Level Summary Results

Discussion

As can be seen in table above, the statistically most repeated values measured during the operational period of Day 1 and Day 2 were 43 and 46 dB, respectively. As can be seen, the lowest most repeated value (43dB) equates to the lowest L_{A90,15min} background level recorded. Therefore, it is understood that this value is deemed to be robust and it will be used in the subsequent assessment.

3.5. Subjective impression & Context

During the site visit, the engineer found that the acoustic environment of the closest residential premises was found to be low, as the results shown above demonstrate. The main sound sources of this were found to be the noise emissions from the existing commercial units alongside with the road noise from Spring Vale Drive, Market Street and Spring Vale Street.

3.6. Uncertainty

BS4142:2014 section 10.0 states that uncertainty in the calculation of sound levels during the assessment process can arise from both the measured values and calculation methods.

To ensure the accuracy of the assessment consideration has been taken for the level of uncertainty in the measured data and associated calculations in the proposed methodology used to undertake the assessment. Where the level of uncertainty could affect the conclusion, reasonably practicable steps have been taken to minimise the level of uncertainty. Where the level of uncertainty is excessive, additional measurements and site visits have been conducted to increase the confidence in the results. In all instances the following steps have been taken to address the uncertainty;

- 1) Measured Values; A detailed understanding of the source of noise under investigation has been conducted including consideration for the complexity, variability over time and location, the character and effect of the residual sound level in comparison with the source, the measurement location, quantity of measurements and distance/intervening ground conditions, measurement time interval and the range of times measurement were taken, the suitability of weather conditions, the level of rounding and the classification of the instrumentation used to conduct the assessment.
- 2) Calculation Methods; Consideration has been taken for the accuracy of the measured sound levels, the character of the sound emissions in question, the calculation method and the simplification of the real situation to "fit" the modelled situation. Recognised standards and validated methods and processes have been used to establish accurate values during the calculation process.

For the avoidance of doubt, the level of uncertainty will not be quantified. If appropriate consideration is taken for points 1 and 2 during the collection of data and analysis thereof, then the influence of uncertainty in the final result is at its lowest practical value.



4. Noise Assessment

4.1. BS4142:2014 – Internal Breakout Assessment

The following section outlines the breakout noise from the new industrial units.

4.1.1. Specific Sound Level

For warehouse operations in light industrial units such as the proposed, it would be reasonable to assume an upper internal operational noise level equivalent to the Lower Action Level of the Noise at Work Regulations 2005 which is L_{Aeq} 85.0 dB. This level is reasonably loud and would require a raised voiced conversation for communication between two individuals 0.5m apart.

Based on the specifications outlined in the design & access statement, the noise breakout from the proposed development has been calculated assuming the following criteria:

- The walls will be constructed of profiled metal cladding, similar to Kingspan KS1000 paneling, providing a sound reduction of 24 dB R_w .
- The roof is to be constructed of profiled metal cladding coupled with profiled translucent panels, similar to Kingspan Day-Lite Trapezoidal paneling, providing a sound reduction of 22 dB R_w .

Description	Internal $L_{Aeq,t}$ (dB)	Façade Noise Reduction (dB)	Inside to Outside Correction (dB) (Internal – R_w – 6)
Facades and Roof	85.0	24.0 R_w	55.0
Roof Light Panels	85.0	22.0 R_w	57.0

Table 7.0 – Breakout Calculations

The specific sound level at the NSR has been calculated using SoundPlan 8.1, which undertakes its calculation in accordance with the guidance given in ISO9613 – 1:1993 and ISO9613 – 2:1996.

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 mixed, 'soft' and 'hard', for the purpose of the assessment the ground has been considered as 'hard'.
- The sound levels presented in the section above have been inputted into a sound map.
- The height of the existing external walls is 1.8m, as per provided plans.

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

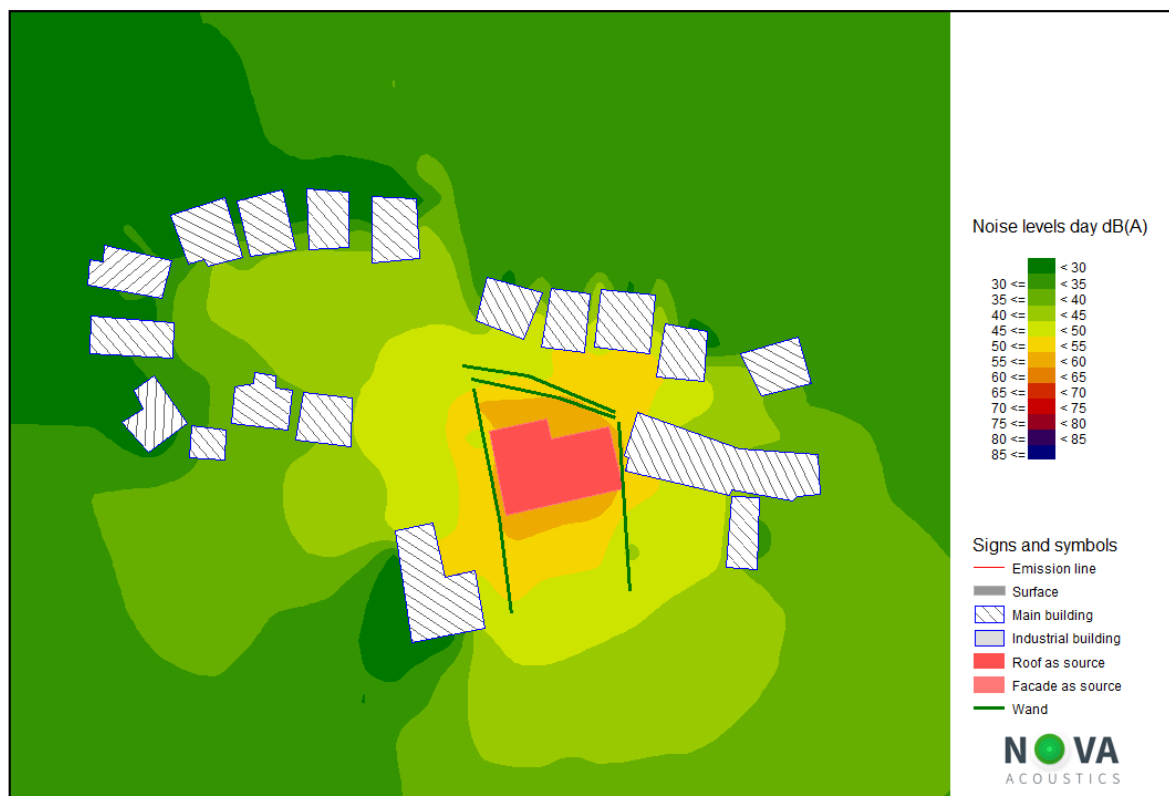


Figure 2.0 – Specific Sound Level Map of Internal Breakout

NSR	Specific Sound Level (dB)
1	51.0

Table 8.0 – Specific Sound Level at NSR Summary

4.1.2. Rating Penalty Assessment

Considering the requirements of the rating penalty, an assessment of the various sound sources associated with the Proposed Development, in terms of whether any rating penalties are applicable, and has been detailed in the following table.

Source	Tonality	Impulsivity	Intermittency	Other Sound Characteristics
Internal Operations	-	+3	+3	-
Discussion				
The usage of the industrial units is currently unknown, so a rating penalty has been applied on the assumption and will not be a continuous source, but one that changes throughout operational hours. In total, a +6 dB penalty will be applied to the specific sound levels at the NSRs.				

Table 9.0 – Rating Penalty Assessment

4.1.3. Rating Level

Incorporating the rating penalties with the specific sound levels, the rating sound levels have been derived and have been detailed in the following table.

NSR	Rating Sound Level (dB)
1	57.0

Table 10.0 – Specific Sound Level at NSR Summary

4.1.4. BS4142 Assessment

The rating sound level has been assessed in accordance with BS4142:2014 at all NSRs. The BS4142:2014 assessment at the NSR, during day time operational periods can be seen in the table below.

Results	Sound Level (dB)	Notes
Rating Sound Level	57.0	As shown in Table 18.0
Lowest Background Sound Level	43.0	As shown in Table 12.0
Excess of Rating over Lowest Background Sound Level	+14.0	Assessment Indicates an 'Significant Adverse Impact'.

Table 11.0 – BS4142:2014 Assessment

Discussion

As can be seen in the table above, the predicted noise emissions due to noise breakout of the units are predicted to cause an 'Significant Adverse Impact' the rating noise level is above 14.0 dB above the background sound level. This is classed as SOAEL (Significant Observed Adverse Effect Level) when assessed in accordance with the NPSE and NPPF. Therefore, further mitigation and recommendations are presented in Section 4.3 of this report.

4.2. Increase in Ambient Noise Level Assessment

The following section analyses the expected increase in ambient noise levels in the surrounding area due to the proposed development. The rating sound levels associated with the proposed development are logarithmically added to the lowest measured residual sound level. The higher the increase in noise levels the higher the impact. In addition, the plant noise has been added just in case some plant equipment would be installed in the future.

Increase in Ambient Noise Level at NSR Assessment	
Description	Value (dB)
Internal Noise Breakout	51.0
Lowest Measured Ambient Noise Level	54.0
Resulting Noise Level	56.0

Increase in Ambient Noise Level	+2.0
Expected Impact	'Not Significant'

Table 12.0 –Increase in Ambient Noise Level Assessment

Discussion

The assessment above indicates that the ambient noise level may rise by 2.0 dB, considering the noise emissions from the proposed development, the impact on the surrounding NSRs is predicted to be 'Not Significant'.

4.3. Recommendations and Mitigation

The acoustic environment of the area and the data collected shows a low background noise due to the low activity of the area at the Nearest Sensitive Receptor. Due to that, Section 4.1.4 shows that the noise emissions associated to the proposed site will fall 14 dB above the lowest background sound level measured. Therefore, the following section outlines the mitigation measures that are necessary to reduce the impact of Proposed Development.

- The operational hours should not exceed 08:00 – 17:00 Monday to Friday, as stated.
- All doors and or shutters should remain closed during operational hours.
- Upgrade the shed panelling to provide a minimum sound reduction of 40 dB R_w . An example of adequate solution can be a pre-finished steel cladding system from TATA STEEL. See technical data within Appendix F.

Internal Breakout Assessment

Should the above recommendation be implemented we would expect the Rating Sound Level from the noise emission during the proposed operational hours to be 40.0 dB. Therefore, it will fall a minimum of 3.0 dB below the lowest $L_{A90.15min}$, indicating thus "negligible impact, depending on the context" when assessing in accordance with BS4142:2014. This is classed as NOEL (No Observed Effect Level) when assessed in accordance with the NPSE and NPPF. In addition, Figure 3.0 show the noise emissions associated to the development once the listed mitigations and recommendations have been implemented.





Figure 3.0 – Specific Sound Level Map of Internal Breakout with the Recommended Mitigation.

Increase in Ambient Noise Level Assessment

The following table shows the increase in ambient noise level assessment undertaken once the mitigations and recommendations have been implemented.

Increase in Ambient Noise Level at NSR Assessment	
Description	Value (dB)
Internal Noise Breakout	37.0
Lowest Measured Ambient Noise Level	54.0
Resulting Noise Level	54.0
Increase in Ambient Noise Level	+0.0 dB
Expected Impact	'Not Significant'

Table 13.0 – Increase in Ambient Noise Level Assessment

As can be seen in table above, should the above recommendation be implemented we would expect a 'Not significant impact' at the NSR with a no increase in the ambient noise level caused by the noise emissions associated to the proposed development.

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 s_1 and s_2 is given by $20 \log_{10} (s_1 / s_2)$. 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. L_{max} is sometimes used for the assessment of occasional loud noises, which may have little effect on the overall L_{eq} 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. L_{90} 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. L_{10} 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.

A

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 be 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.

National Planning Policy Framework (2019)

Government policy on noise is set out in the National Planning Policy Framework (NPPF), published in 2019. 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 170e, 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 180 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 impacts 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.*

Noise Policy Statement for England

Paragraph 180 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.

IEMA Guidelines on Noise Impact Assessments

The IEMA Guidelines for Environmental Noise Assessment address the key principles of noise impact assessment and are applicable to all development proposals where noise effects may occur. The guidelines set out key principles for noise impact assessment relevant to all types of project regardless of size. The guidance provides advice with regards to the collection of baseline noise data, prediction of noise levels and how noise should be assessed. The guidance recognizes that the effect associated with a noise impact will be dependent on a number of factors including but not limited to the sensitivity of the receptor, frequency and duration of the noise source and time of day. The Guidelines accept that a simple change in noise levels using a single noise indicator may fail to adequately reveal the actual noise impact of the proposal. The character of the noise must be considered and the Guidelines suggest comparing several noise indicators such as the LAeq, LMax and LA90 as a more rigorous approach.

Absolute levels such as those set out in WHO Guidelines are also considered and the Guidelines suggest that a change in noise levels in an area where the existing levels are above WHO Guidelines

should be considered as having more of an adverse effect than a change in noise levels in an area where existing levels are well below.

The Guidelines stop short of providing specific assessment criteria which developments should achieve but instead suggests that the methodology adopted should be selected on a site by site basis regarding relevant national and local standards.

The Guidelines contain effect descriptors for changes in noise levels and for noise effect levels. These are summarized below:

Effect Descriptors	
Very substantial	Greater than 10 dB L_{Aeq} change in sound level perceived at a receptor of great sensitivity to noise
Substantial	Greater than 5 dB L_{Aeq} change in sound level at a noise sensitive receptor, or a 5 to 9.9 dB L_{Aeq} change in sound level at a receptor of great sensitivity to noise
Moderate	A 3 to 4.9 dB L_{Aeq} change in sound level at a sensitive or highly sensitive noise receptor, or a greater than 5dB L_{Aeq} change in sound level at a receptor of some sensitivity
Slight	A 3 to 4.9 dB L_{Aeq} change in sound level at a receptor of some sensitivity
None/Not Significant	Less than 2.9 dB L_{Aeq} change in sound level and/or all receptors are of negligible sensitivity to noise or marginal to the zone of influence of the proposals

Table 14.0 – IEMA Guidelines effect descriptors

Noise Effect Level			
Time	Lowest Adverse Effect Level	Observed Adverse Effect Level	Significant Adverse Effect Level
07:00 - 23:00	50 dB $L_{Aeq,16\text{ hour}}$		60 dB $L_{Aeq,16\text{ hour}}$
23:00 - 07:00	40 dB $L_{Aeq,8\text{ hour}}$		55 dB $L_{Aeq,8\text{ hour}}$
	60 dB L_{AFMax} (at the facade)		80 dB L_{AFMax} (at the facade)

Table 15.0 – IEMA Guidelines noise effect level

The Guidelines are not prescriptive as to how a noise impact assessment should be carried out, and allow assessors to consider factors such as frequency spectra, days and times of operation, frequency of operation and any other factor which allows the noise to be assessed in context.

BS 4142:2014

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 $L_{Ar,T}$ '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.

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:

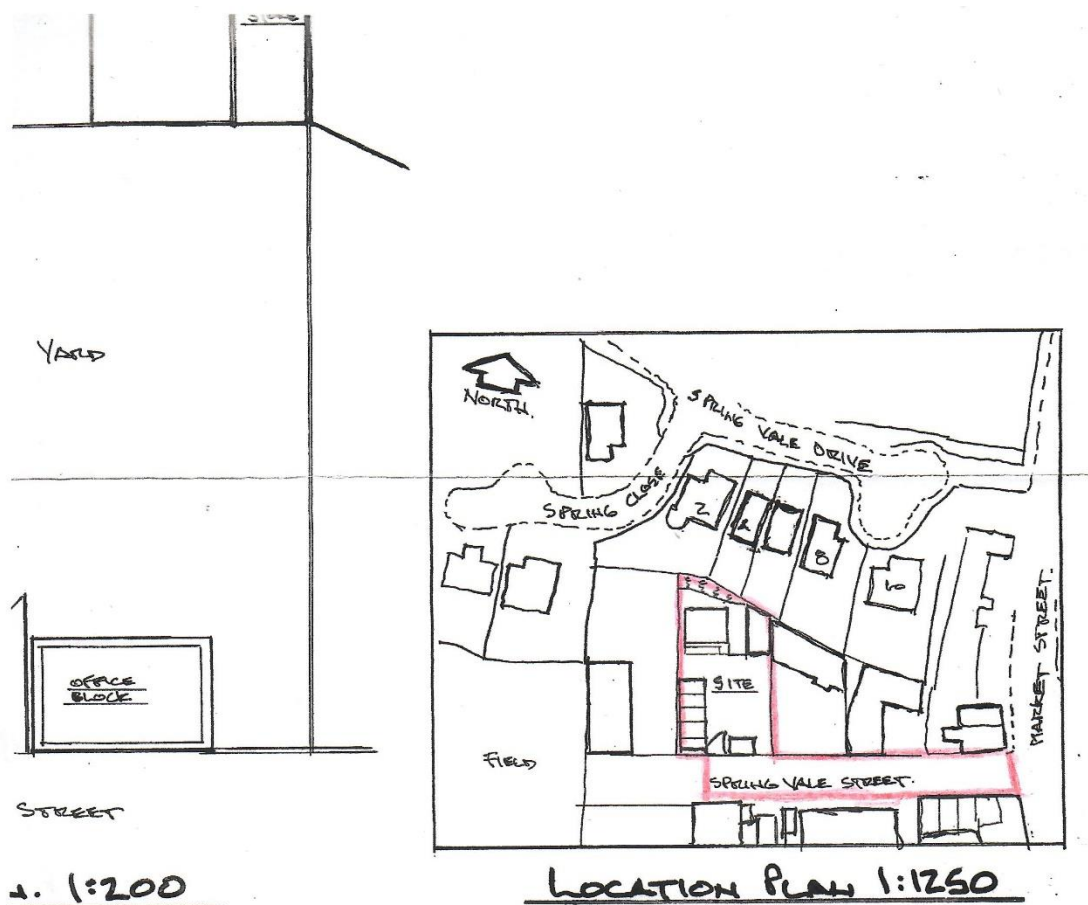
- "Typically, the greater this difference, the greater the magnitude of the impact."
- "A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context."
- "A difference of around +5dB is likely to be an indication of an adverse impact, depending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



Architectural & Building Services NEIL BUTTERWORTH Tel: Mobile: 07785 275483 89 Higher Ainsworth Road, Radcliffe, Manchester, M26 4JJ.			
Job Title PROPOSED NEW INDUSTRIAL UNITS. WITH OFFICES, AT SPRING VALE ST. TOTTINGTON, BURY			
Drawing Title PLANS & ELEVATIONS (EXISTING)			
Scale 1:100	Date JULY 19	Drawn by N.B.	Drawing No. 1

© copyright.

③

A

B

* SEE DWG NO. 3 FOR SECTIONS.

WASTE LAND (NO MANS LAND)

BOUNDARY FENCE

RETAINING WALL

BINS AREA

APPROX 5000

14000mm

UNIT 1.

UNIT 2

10000mm

1150

1500

7350

1500

19000mm

EXISTING 1800mm HIGH CONCRETE PANEL FENCING

450

A

DISABLED PARKING

PARKING SPACES (50x2.5m)

1 2 3 4 5

10300mm

5000

1500

2500

1500

2500

1500

7800

6000

2000

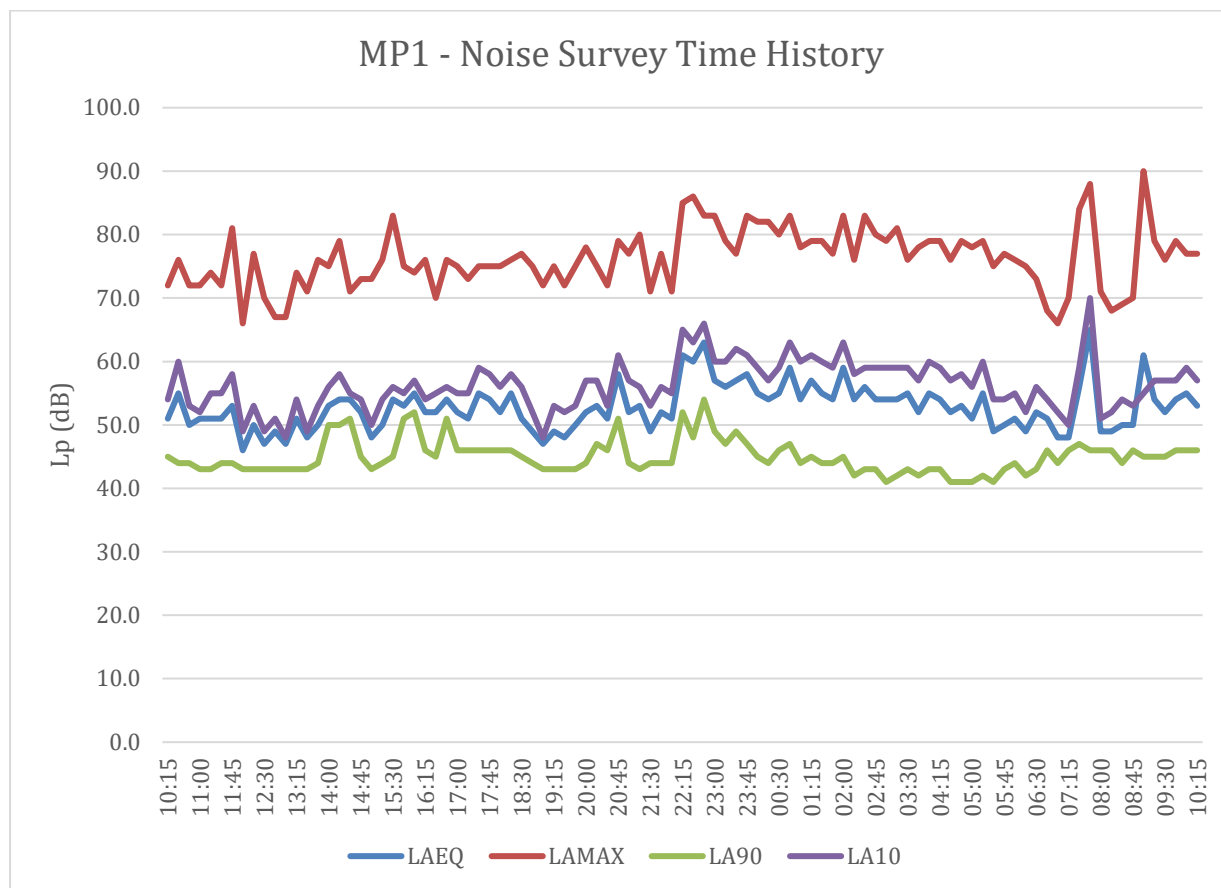
NEW SLIDING GATE & TUBES

NEW 20m HIGH STEEL RAILING

ADDITIONAL PARKING OUTSIDE SITE, AS EVERYONE ELSE DOES

SITE PLAN 1:200.

Appendix E – Environmental Sound Survey



Appendix F – Technical Datasheet

Built-up systems

Effect of Insulation thickness In built-up systems

Figure 12. Effect of insulation thickness on the sound reduction index

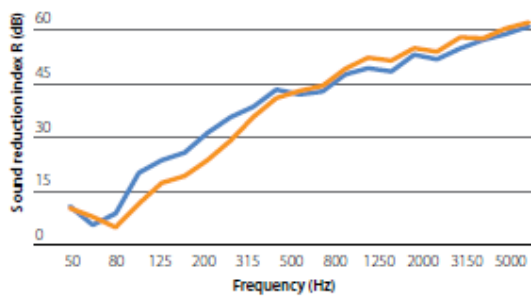
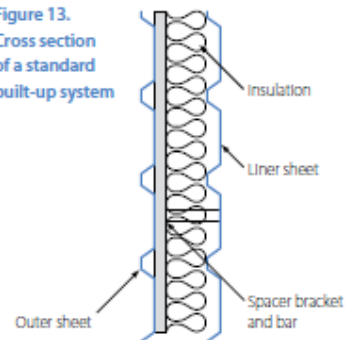


Figure 13. Cross section of a standard built-up system



Key	Construction	Single figure rating R_w	Thermal performance U-value
■	19/1000 liner 180 mm rock mineral wool 23 Kg/m ³ 32/1000 outer	45 dB	0.25
■	19/1000 liner 120 mm rock mineral wool 23 Kg/m ³ 32/1000 outer	40 dB	0.35

NOVA