

41-43 Faulkner Street Manchester M1 4EE

Noise Impact Assessment Report

30162/NIA1

14 November 2022

For:
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10/F, 1 City Approach
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Document Control

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Noise Impact Assessment Report 30162/NIA1

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1.0 Introduction

Hann Tucker Associates Limited (Hann Tucker) has been commissioned to undertake a noise assessment for a site in Manchester.

The site, which is located on Faulkner Street, is being considered for change of use of the upper ground floor unit at 43 Faulkner Street from Sui Generis Betting Shop to Class E(b).

The site is subject to road noise, primarily from the surrounding roads, entertainment noise associated with the various bars and pubs surrounding the site, and commercial noise from the various restaurants surrounding the site.

Baseline noise conditions have been established by means of a detailed noise survey, presented herein. The findings have subsequently been used to assess the suitability of the site for residential use. Measures required to mitigate noise impacts for the proposed development (when operational) have been discussed in context with relevant national & local planning policies, design standards and good practice guides.

2.0 Objectives

To establish by means of an unmanned weekend long survey the existing L_{Amax} , L_{Aeq} and L_{A90} environmental road, rail and air traffic noise levels at 1No. Secure and accessible on-site positions using fully computerised noise monitoring equipment.

Measurement procedures shall be in general accordance with British Standards BS 7445 "Description and measurement of environmental noise".

Measurement procedures shall be in general accordance with those described in BS 4142:2014, Method for rating industrial noise affecting mixed residential areas, published by the British Standards Institution.

The survey will enable noise emission limits from the developments to be identified with reference to the requirements of the Local Authority and/or the application of BS 4142:2014 and to minimise the possibility of noise nuisance to neighbours.

Whilst on site, to measure the existing sound insulation performance of the floor separating the unit and the unit above. Also, to establish the in-side to out sound insulation of the existing façade.



To undertake a desktop assessment to confirm the limiting noise levels within the unit to limit disturbance to neighbours.

To present our methodology and findings in a detailed Environmental Noise Impact Assessment Report suitable for submitting to the Local Authority.

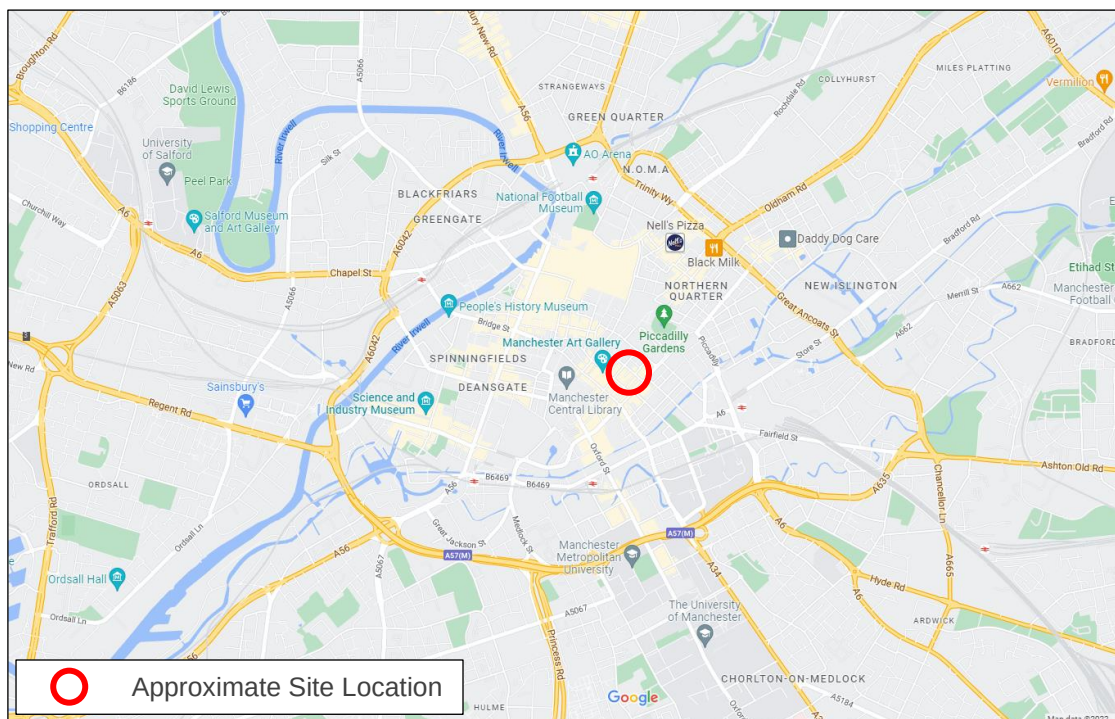
3.0 Acoustic Terminology

For an explanation of the acoustic terminology used in this report please refer to Appendix A enclosed.

4.0 Site Description

4.1 Location

The site is located on Faulkner Street and falls within the jurisdiction of Manchester City Council. See Location Map below.



Location Map (Google Maps)

4.2 Description

The site is located on Faulkner Street and is bound by Nicholas Street, Charlotte Street and Portland Street.



The surrounding buildings predominantly comprise of entertainment buildings (bars, pubs, restaurants etc.). Other commercial buildings (shops) are also situated around the site. The nearest residential building is noted to be Faulkner Court to the southwest.

The site in relation its surroundings is shown on the Site Plan below.



Site Plan (Google Earth)

5.0 Planning Policy, Standards & Guidance

5.1 National Planning Policies

In order to provide a suitable assessment a number of national planning policies have been considered, including:

- The National Planning Policy Framework (NPPF), 2021
- The Noise Policy Statement for England (NPSE), 2010
- Planning Practice Guidance – Noise (PPGN), 2019

The above documents highlight the importance of considering the potential noise effects on any new residential development and provide a qualitative approach to assessment. However, each of the above does not provide any quantitative guidance. As such, all quantitative guidance used to form a noise impact assessment is taken from various other standards and guidance as detailed in the following sections.



A detailed summary of each of the above National Planning Policies is provided in Appendix B for reference.

5.2 Standards & Guides

5.2.1 BS 4142:2014

BS 4142: 2014 describes methods for rating and assessing the effects of outdoor sound levels, of an industrial and/or a commercial nature, *“on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident”*.

The impact of a specific sound is indicated by subtracting the existing background noise level from the rating level (i.e. noise level from the proposed items of plant/machinery/etc plus any acoustic feature corrections). The standard states that:

- “a difference of around +10dB or more is likely to be an indication of a significant adverse impact”;
- “a difference of around +5dB is of marginal significance is likely to be an indication of an 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”.

The noise from the new development is expressed in terms of a rating level and given as a $L_{Aeq, T}$ noise level. The existing background noise level is expressed in terms of a $L_{A90, T}$ noise level. T is the assessment time interval, which is 1-hour for operations during daytime hours (07:00 to 23:00) and 15-minutes for operations during night-time hours (23:00 to 07:00).

BS 4142:2014 states that if a noise source contains an ‘acoustic feature’, such as tonality, intermittency or impulsiveness, an appropriate penalty should be applied.

5.3 Local Planning Guidance

Manchester City Council requirements are outlined in Section 3.0 of Manchester City Council’s Planning & Noise Technical Guidance document (December 2015).

5.3.1 Fixed Plant Noise Emissions

Section 3.6.1.5.1 outlines that the noise assessment for fixed plant should be based on BS 4142:2014 and the assessment must demonstrate that:



“Externally mounted ancillary plant, equipment and servicing shall be selected and/or acoustically treated in accordance with a scheme so as to achieve a rating level of 5 dB (L_{Aeq}) below the typical background (L_{A90}) level at the nearest noise sensitive location.”

5.3.2 Amplified Sound Egress Criteria - Residential premises

Section 3.7.1.2 stipulates the following criteria regarding entertainment noise egress, which apply to nearby residential properties only:

“Entertainment noise ($L_{Aeq,5min}$) should be controlled to 5dB below the typical background noise level (L_{A90}) in each octave band at the nearest noise sensitive location.”

These are cumulative limits and consider the contributions from all areas.

5.3.3 Amplified Sound Egress Criteria – Office premises

MCC stipulate amplified noise egress criteria for residential receptors should not exceed 5 dB below the background noise level, however, there is no specific requirements to control noise egress to office developments. As such, to minimise the risk of disturbance to adjacent office developments it is advised that the cumulative noise level as a result of noise egress due to amplified music does not exceed 5 dB below the internal noise level.

6.0 Baseline Noise Survey

6.1 Procedure

Unattended noise monitoring was undertaken on site over a 5-day period to establish full daytime and night-time noise levels over a typical weekday and weekend period. The monitoring was carried out between 08:30 on Friday 26 November 2022 and 10:00 on Wednesday 2 November 2022 with equipment set up to record broadband and spectral (octave band) sound pressure levels over discrete 2 and 15-minute periods.

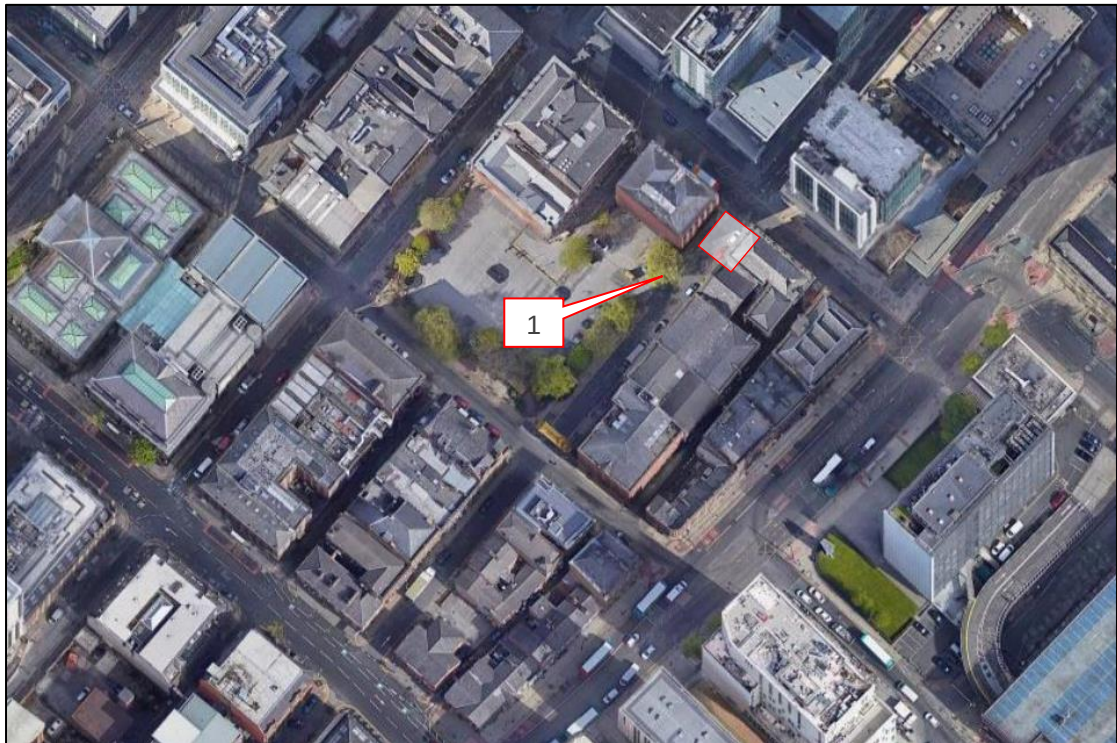
The survey was performed by Cameron Maskew BEng(Hons), AMIOA. All measurements were collated in general accordance with BS 7445-1:2003 Description and Measurement of Environmental Noise.

6.2 Measurement Positions

The measurement positions were as described and illustrated below.



Position	Type	Description
1	Unattended	To the west of the site, located on Faulkner Street. Sound level meter mounted to lamppost approximately 3.5m above ground level. Microphone in free-field conditions.



Site Plan (Google Earth)

6.3 Weather Conditions

For the unattended survey between Friday 28 October 2022 and Wednesday 2 November 2022, local internet weather reports indicated no notable periods of prolonged and/or heavy rainfall, with temperatures ranging from approximately 8°C (night) to 17°C (day) and wind speeds were generally less than 5m/s.

During our time on site, skies were clear, wind conditions were calm and from a southerly direction and road surfaces were dry.

Weather conditions were therefore deemed suitable for obtaining representative noise readings.

6.4 Instrumentation

The instrumentation used during the survey is presented in the table below.



Position	Description	Manufacturer	Type	Serial Number	Last Calibration
MP1	Sound Level Meter	Larson Davis	LxT	5111	10/06/2022
	Type 1 Calibrator	Larson Davis	CAL200	3083	06/05/2021

Each unattended sound level meter was housed in a weatherproof case with the microphone connected via an extension cable.

Each sound level meter was calibrated prior to and on completion of the survey. No significant deviations occurred (not more than 0.3 dB).

6.5 Results

The results of the unattended survey have been plotted on Time History Graphs 30162/TH1. These graphs present the 15-minute A-weighted (dBA) L₉₀, Leq and L_{max} levels at Position 1 throughout the duration of the survey.

A summary of the results, as used to inform subsequent assessments against current guidelines, is presented in the table below. The L_{A90} values presented are the 'representative' levels determined through statistical analysis of the 15-minute readings, in line with BS 4142. L_{Afmax} values are the '15th highest' 5-minute value. All results in the following table are presented as free-field levels.

Position	Daytime (07:00 – 23:00 hrs)		Night-time (23:00 – 07:00 hrs)			
	L _{Aeq,16hr}	L _{A90}	L _{Aeq,8hr}	L _{A90}	15 th Highest L _{Amax}	Highest Typical L _{Amax}
MP1	62	55	59	52	78	84

¹External L_{AFmax} noise level not normally exceeded more than 10 times a night. This is considered to be the ventilation design case.

²Not normally exceeded absolute night-time maximum events should be calculated in-line with the paper *Assessing L_{max} for residential developments: the AVO Guide Approach*. This is considered to be the overheating design case when assessing opening windows as a means of overheating control.

The day-time L_{A90} level has been used in our assessment due to the operational times of the proposed café. The following octave band L_{A90} were determined from our unattended survey:

Description	Octave band L _{A90} noise levels							dBA
	63	125	250	500	1k	2k	4k	
Daytime (07:00 – 23:00)	60	55	53	51	51	47	43	55



6.6 Discussion of Noise Climate

Due to the nature of the survey, i.e., unattended, it is not possible to accurately describe the dominant noise sources, or specific noise events throughout the entire survey period. However, at the beginning and end of the survey period the noise climate was noted to be dominated by road traffic noise on Faulkner Street.

There are a number of entertainment establishments nearby to the site, however no significant elevations in noise levels were witnessed over the evening/weekend periods which suggests the site is not significantly impacted by entertainment venue noise.

7.0 Sound Insulation Testing

7.1 Procedure

Hann Tucker Associates have attended site to undertake sound insulation testing the separating floor and through the external facade. The testing for the floor was carried out from the ground floor level space to office space above. The testing for the façade was carried out from ground floor level space to street level.

The testing was undertaken on Tuesday 8th November 2022 by Cameron Maskew, BSc (Hons), AMIOA.

The floor sound insulation testing was undertaken in general accordance with BS EN ISO 140-4:1998 '*Acoustics – Measurement of airborne sound insulation in buildings and of building elements*'.

Due to site limitations, testing the façade in accordance with BS EN ISO 140-4:1998 was deemed impractical. The loudspeaker was therefore positioned within the unit and the sound reduction was measured 1.5m in front of the façade at street level. A level difference was taken between the source room and 1.5m from the façade to approximate the sound reduction performance.

The tests were undertaken with the premises empty of all fixtures and fittings.

7.2 Equipment

The following equipment was used for the testing.



Equipment	Model	Serial Number	Calibration Date	Certificate No
Precision Sound Analyser Meter	Brüel & Kjær Type 2250	2600445	18/01/2019	04083/2
Sound Level Calibrator	Brüel & Kjær Type 4231	2271905	16/07/2020	04737/1
Sound Source	Custom made, un-ported sealed cabinet type	N/A	N/A	N/A

7.3 Results

The results of the airborne sound insulation testing are presented in the table below:

Description	Element	Measured Level Difference (dB D) at Octave Band Centre Frequency (Hz)							
		63	125	250	500	1000	2000	4000	Broadband D _w
Unit 43 to Office above	Floor	33	38	44	54	60	61	65	56
Unit 43 to Faulkner Street	Façade	17	20	27	32	30	32	34	31

8.0 Noise Impact Assessments (Overview)

The following sections present our assessment of the various potential noise impacts associated with the development proposals, covering:

- **Commercial Unit Operational Noise Transfer via Floor:** The sound insulation performance of the floor will be used to establish the maximum permissible noise level in the retail units based only on noise transfer via the floor to offices above.
- **Commercial Unit External Noise Breakout:** The sound insulation performance of the façade will be used to establish the maximum permissible noise level in the retail units based only on noise transfer via the façade to nearby receptors.
- **Site Suitability:** The above assessments shall be used to establish an absolute internal noise level limit within the retail units, against which suitability for certain uses can be assessed.
- **Plant Noise Emissions:** Setting limits for new items of fixed plant against MCC guidance.

To inform our assessment of the commercial units, we have drawn upon previously measured noise levels for a range of uses, as set out below, to be considered as typical highest 1-hour noise levels during reasonable operation.



Description	Reverberant Noise Level (dB L _{eq,1hr}) at Octave Band Centre Frequency (Hz)							dBA
	63	125	250	500	1k	2k	4k	
Food and Drink <i>Typical restaurant with background music</i>	60	67	69	71	70	66	60	74

NB: We have not considered Professional Services Use to generate any higher levels of noise than the aforementioned.

With reference to the above, it is not possible to account for every possible scenario within each use class, however the above is intended to provide a reasonable baseline against which the general use can be assessed for feasibility with regards to planning permission. There is of course a wide range of noise levels that could be produced by any particular operation, it would therefore be sensible for future tenants that may have the capacity to introduce high levels of noise to review their anticipated noise levels against the relevant noise emission criteria. MCC may wish to secure this through a suitably worded condition of planning.

9.0 Commercial Unit Operational Noise Assessment

9.1 Operational Noise Transfer via Floor

9.1.1 Criteria

In the absence of specific MCC criteria for noise transfer from commercial spaces to office spaces, it is recommended that to prevent loss of amenity to the office directly above, the aim should be to achieve maintain an internal noise level 10 dB below the standard BS 8233:2014 internal ambient noise level criteria.

Based on the above, and with consideration to (a) the need for spectral noise control in octave bands between 63 Hz and 4 kHz, and (b) the fact that the offices will generally not be occupied when the noisier commercial uses are in full operation, we would propose that reverberant noise levels from the commercial units within the office spaces directly above should be controlled so as to not exceed NR 30 (~35 dB L_{Aeq}).

9.1.2 Internal Building Fabric Assessment

The below presents the sound level difference provided by the separating floor, based on measurements undertaken on-site. The sound insulation performance was noted to be relatively consistent across the floor slab and the below is taken as the lowest measured sound level difference from all floor slab measurements, at each frequency.



The measurements of the level difference of the existing separating floor are considered representative of the future separating floor construction should an additional suspended ceiling **not** be installed. As such, the sound insulation performances presented in Section 7.3 have been used to inform subsequent assessment.

We have assessed noise transfer based on the criteria set out above to establish the internal sound level limit within retail units based on noise transfer via the floor only. The below must be considered in conjunction with noise emissions via the façade and should not be taken as definitive internal noise level limits.

Description	Octave Band Centre Frequency (Hz)						
	63	125	250	500	1k	2k	4k
Criteria in Offices (NR 30)	59	48	40	34	30	27	25
Level difference of existing floor (dB <i>D</i>)	33	38	44	54	60	61	65
Internal noise level limit in retail unit (dB <i>L_{eq}</i>)	92	86	84	88	90	89	90

NB: As noted above, the above consider structurally connected receptors only, and should not be used in isolation to establish internal noise level limits.

9.2 Operational Noise Breakout via Façade

9.2.1 Criteria

MCC recommends that noise (*L_{eq}*) breaking out through the building frontage of an entertainment venue should not exceed 5 dB below the background noise level (*L₉₀*) at all octave band frequencies at the nearest noise sensitive windows.

The following octave band limits for entertainment noise have been calculated to achieve compliance 5dB below day-time background noise levels 1m from nearest noise sensitive receptor window.

Description	Entertainment Noise Level Limit (dB <i>L_{eq,15min}</i>) at Octave Band Centre Frequency (Hz)							dBA
	63	125	250	500	1k	2k	4k	
Daytime (07:00 – 23:00)	55	50	48	46	46	42	38	50

9.2.2 Assessment

The façade comprises solid masonry with punched in single glazed window systems.



We understand the operational hours of the future café is to be between the hours of 12:00 and 21:00, we have assessed noise breakout to the worst affected receptors as follows:

Daytime (07:00 – 23:00) RH Law Solicitors' office, 9m away

We have assessed noise breakout based on the criteria set out above to establish the internal sound level limit within retail units based on noise breakout via the façade only. The below must be considered in conjunction with noise transfer via the floor slab to offices above and should not be taken as definitive internal noise level limits.

Daytime (Federation Building)	Octave Band Centre Frequency (Hz)						
	63	125	250	500	1k	2k	4k
Criteria at receptor (dB L _{eq})	55	50	48	46	46	42	38
Level difference provided by façade (dB D)	17	20	27	32	30	32	34
Distance loss from 1.5m to 9m (dB, Rathe Method)	13	13	13	13	13	13	13
Internal noise level limit in retail unit (dB L_{eq})	85	83	88	91	89	87	85
Typical Noise Levels - Food and Drink <i>Typical restaurant with background music</i>	60	67	69	71	70	66	60
Level difference between typical levels and internal noise limits	-25	-16	-19	-20	-19	-21	-25

9.3 Discussion

Our assessment has indicated that noise emissions from a typical café/restaurant establishment are significantly below the limits calculated for this unit. Regardless, prospective tenants should be asked to verify that their anticipated noise levels are in accordance with the above operational noise level limits. If higher reverberant noise level limits are desired by prospective tenants, this may be feasible via appropriate tenant fit-out (e.g. mass-barrier ceiling, secondary glazing etc.).

9.4 Fixed Plant & Equipment

Based on the results of the noise site and the requirements of the Local Authority, we propose that the following plant noise emission criteria be achieved incident at the nearest noise sensitive windows, with all plant operating simultaneously.

These limits are 5 dB below the representative lowest background sound levels, and are presented as façade noise levels (ie include a +3 dB correction for the presence of a building façade as would be present at the assessment location).



Plant Noise Emission Criteria ($L_{Aeq,T}$, dB)	
Daytime (07:00 – 23:00 hours)	Night-time (23:00 – 07:00 hours)
53	50

Noise shall be assessed in accordance with BS 4142:2014 with corrections applied for any plant emitting noise of a tonal or irregular quality. The above limits shall be subject to the final approval of the Local Authority.

9.4.1 Plant Noise Mitigation Measures

Given the nature of the development, the only significant plant items are likely to be serving the amenity/commercial spaces, including air extraction for kitchens and toilets, air conditioning condenser units, etc. For residential spaces, noise from localised mechanical ventilation will be negligible.

For central plant compounds/outlets, provisions shall be made for the selection of low noise equipment, silencers, enclosures, screens and other acoustic attenuation measures where necessary. The positioning of plant areas should be carefully considered, bearing in mind the likelihood of the nearest receptors being the development's own ground/first floor residential windows.

At this stage it is envisaged that the risk of excessive building services noise can be mitigated by design and this could be secured by a suitably worded condition of planning.

10.0 Conclusions

A detailed environmental noise survey has been undertaken in order to establish the currently prevailing environmental noise climate around the site.

The environmental noise impact upon the proposed dwellings has been assessed in the context of national and local planning policies.

Appropriate target internal noise levels have been proposed. These are achievable using conventional mitigation measures.

The assessment shows the site, subject to appropriate mitigation measures, is suitable for class E(b) use, particularly for the usage case of a café in terms of complying with noise emission limits.

Appendix A – Acoustic Terminology

The acoustic terms used in this report are defined as follows:

dB	Decibel - Used as a measurement of sound level. Decibels are not an absolute unit of measurement but an expression of ratio between two quantities expressed in logarithmic form. The relationships between Decibel levels do not work in the same way that non-logarithmic (linear) numbers work (e.g. 30dB + 30dB = 33dB, not 60dB).
dBA	The human ear is more susceptible to mid-frequency noise than the high and low frequencies. The 'A'-weighting scale approximates this response and allows sound levels to be expressed as an overall single figure value in dBA. The _A subscript is applied to an acoustical parameter to indicate the stated noise level is A-weighted It should be noted that levels in dBA do not have a linear relationship to each other; for similar noises, a change in noise level of 10dBA represents a doubling or halving of subjective loudness. A change of 3dBA is just perceptible.
L _{90,T}	L ₉₀ is the noise level exceeded for 90% of the period <i>T</i> (i.e. the quietest 10% of the measurement) and is often used to describe the background noise level.
L _{eq,T}	L _{eq,T} is the equivalent continuous sound pressure level. It is an average of the total sound energy measured over a specified time period, <i>T</i> .
L _{max}	L _{max} is the maximum sound pressure level recorded over the period stated. L _{max} is sometimes used in assessing environmental noise where occasional loud noises occur, which may have little effect on the L _{eq} noise level.
L _p	Sound Pressure Level (SPL) is the sound pressure relative to a standard reference pressure of 2×10^{-5} Pa. This level varies for a given source according to a number of factors (including but not limited to: distance from the source; positioning; screening and meteorological effects).
L _w	Sound Power Level (SWL) is the total amount of sound energy inherent in a particular sound source, independent of its environment. It is a logarithmic measure of the sound power in comparison to a specified reference level (usually 10^{-12} W).

Appendix B –National Planning Policies

National Planning Policy Framework (NPPF)

The National Planning Policy Framework (NPPF) was first published in 2012, replacing the existing Planning Policy Guidance Note 24 (PPG24) “Planning and Noise”, and sets out the government’s planning policies for England and how these are expected to be applied.

The latest revision of the NPPF (July 2021) states that planning system should contribute to, and enhance, the natural and local environment by (amongst others) *“preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, water or noise pollution or land stability.”*

NPPF advises that planning policies and decisions should ensure:

“...new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development.” [In doing so they should] *“mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life”* and *“identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.”*

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

The NPPF makes reference to the Noise Policy Statement for England.

Noise Policy Statement for England (NPSE)

The Noise Policy Statement for England (NPSE) was published in March 2010 (i.e. before the NPPF). The NPSE is the overarching statement of noise policy for England and applies to all forms of noise other than occupational noise, setting out the long term vision of Government noise policy which is 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.”

That vision is supported by the following NPSE noise policy aims which are reflected in three of the four aims of planning policies and decisions in the NPPF as below:

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

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

The Explanatory Note to the NPSE has three concepts for the assessment of noise in this country:

NOEL – No Observed Effect Level

This is the level below which no effect can be detected and below which there is no detectable effect on health and quality of life due to noise.

LOAEL – Lowest Observable Adverse Effect Level

This is the level above which adverse effects on health and quality of life can be detected.

SOAEL – Significant Observed Adverse Effect Level

This is the level above which significant adverse effects on health and quality of life occur.

None of these three levels are defined numerically and for the SOAEL the NPSE makes it clear that the noise level is likely to vary depending upon the noise source, the receptor and the time of day/day of the week, etc. The need for more research to investigate what may represent an SOAEL for noise is acknowledged in the NPSE and the NPSE asserts that not stating specific SOAEL levels provides policy flexibility in the period until there is further evidence and guidance.

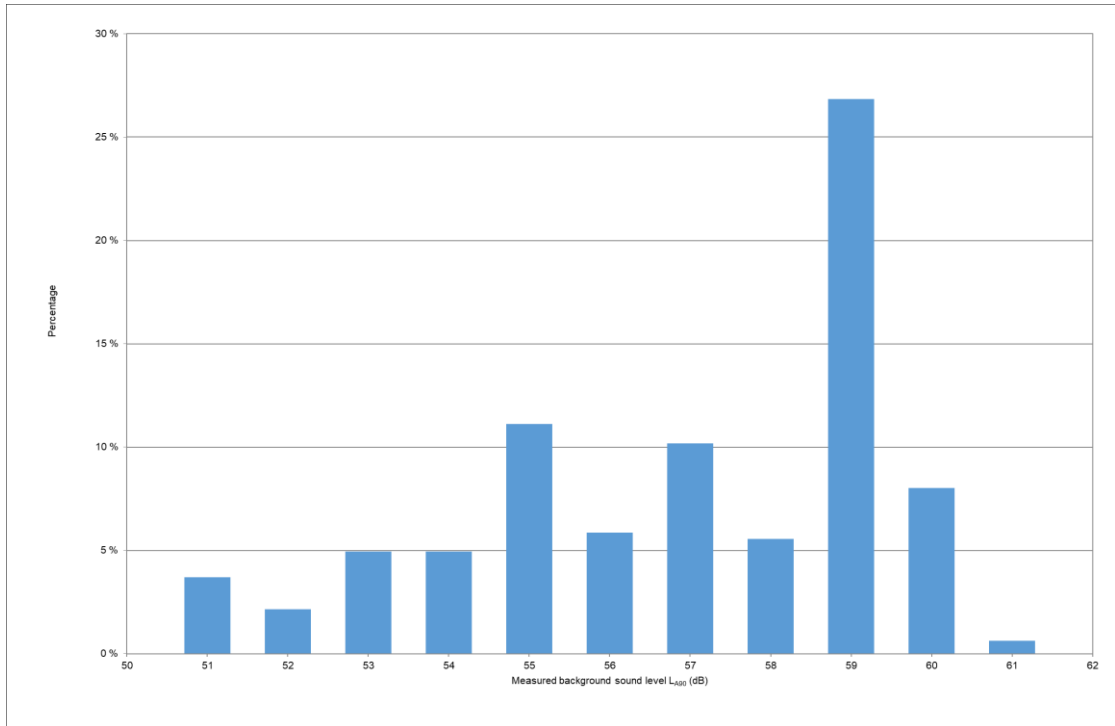
The NPSE concludes by explaining in a little more detail how the LOAEL and SOAEL relate to the three NPSE noise policy aims listed above. It starts with the aim of avoiding significant adverse effects on health and quality of life, then addresses the situation where the noise impact falls between the LOAEL and the SOAEL when *“all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also taking into account the guiding principles of sustainable development.”* The final aim envisages pro-active management of noise to improve health and quality of life, again taking into account the guiding principles of sustainable development which include the need to minimise travel distance between housing and employment uses in an area.

Planning Practice Guidance on Noise (PPG)

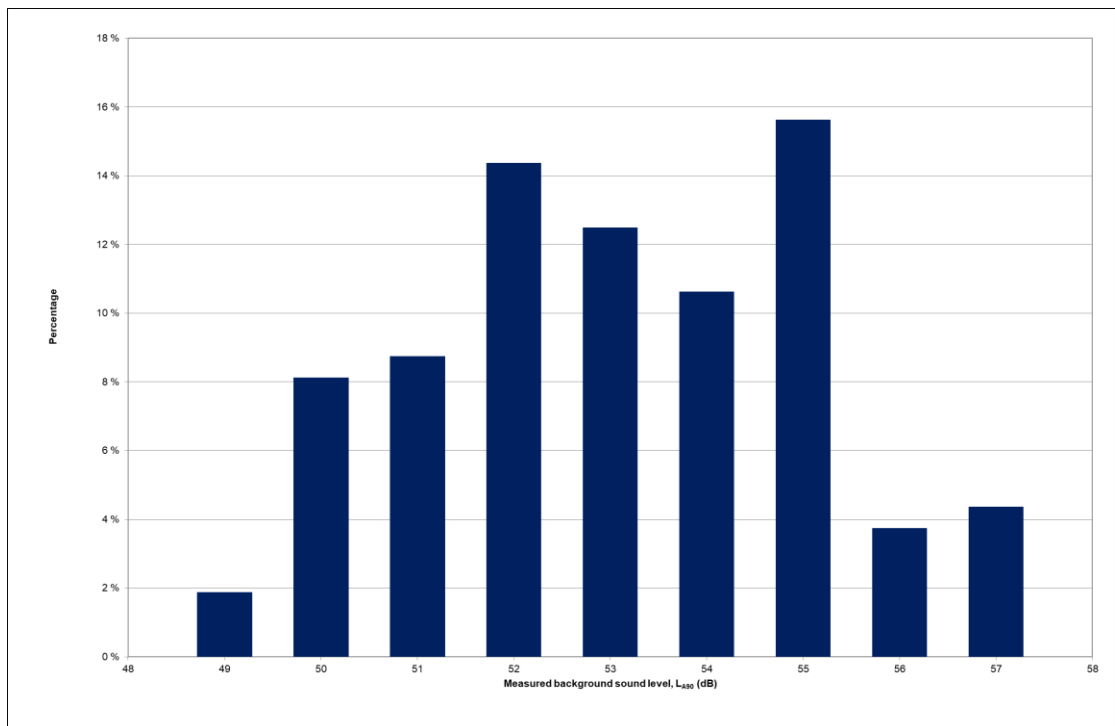
Planning Practice Guidance (PPG) under the NPPF has been published by the Government as a web based resource. This includes specific guidance on Noise although, like the NPPF and NPSE, the PPG does not provide any quantitative advice. It seeks to illustrate a range of effect levels in terms of examples of outcomes as set out in the following table:

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

Appendix C –Time History Graph and Histograms



[MP1] Statistical Analysis of Daytime Background Noise Levels (07:00-23:00)



[MP1] Statistical Analysis of Night-time Background Noise Levels (07:00-23:00)

Faulkner Street

Pos 1

L_{eq} , L_{max} and L_{90} Noise Levels

Friday 28 October 2022 to Wednesday 2 November 2022

