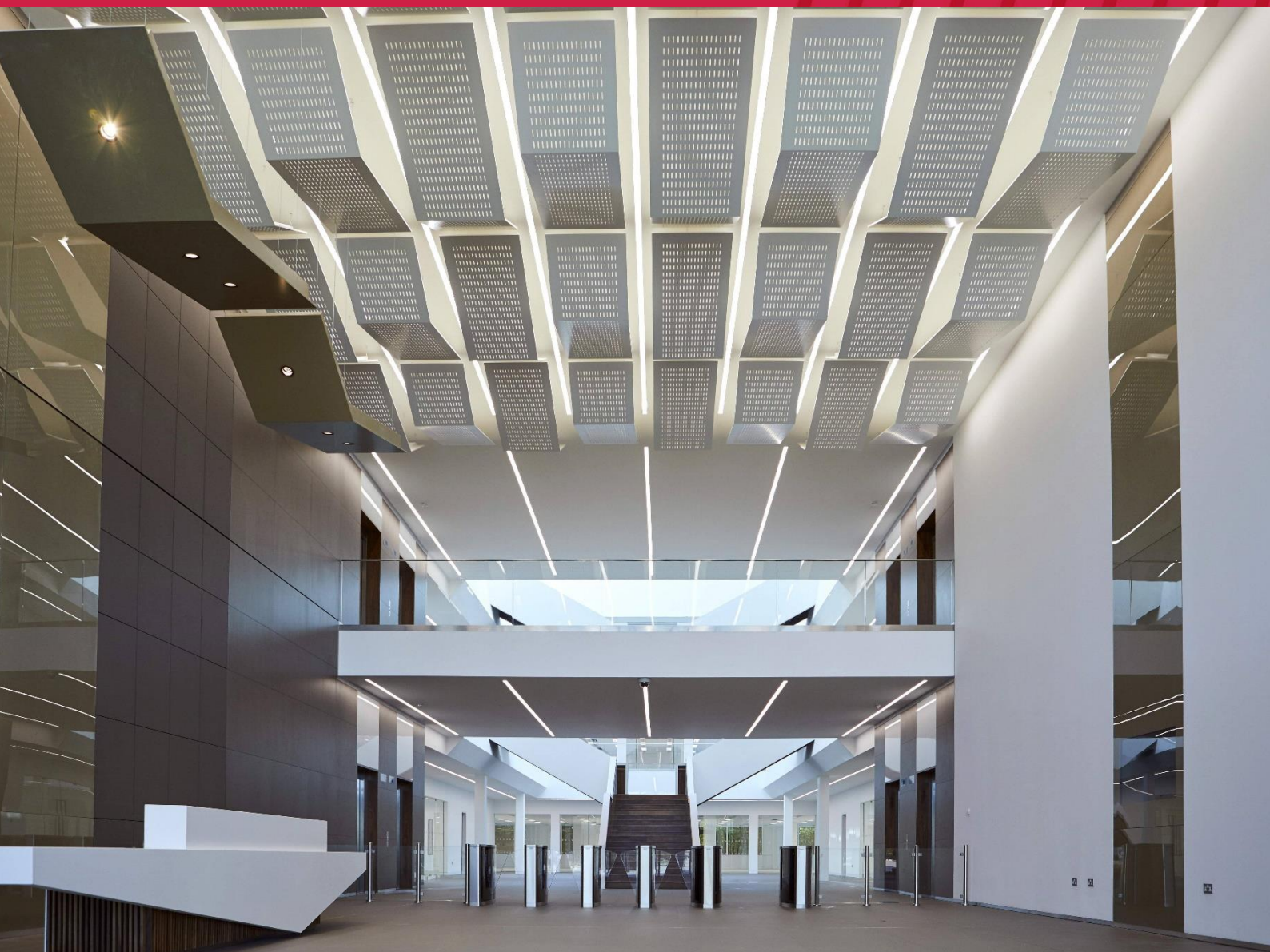


WYTHENSHAW CIVIC CENTRE – NOISE IMPACT ASSESSMENT

Noise Impact Assessment:
Wythenshawe Civic Centre



Document History

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1. INTRODUCTION

MZA Acoustics has been appointed by Kier Construction to provide an acoustic report to support the submission of the planning application for the site at Wythenshawe Civic Centre.

The existing site is currently an unoccupied three-storey building with commercial at ground floor and storage / ancillary uses on upper floors.

The proposal is for the internal renovation and reconfiguration of the existing building to provide offices and community creative spaces including a performance space.

This report presents the results of a baseline noise survey undertaken at the site, which has been used to provide limiting noise levels for the noise emissions from building services plant and equipment.

This report occasionally employs technical language. To assist the reader, a glossary of acoustic terminology is presented in Appendix A.

2. SITE DESCRIPTION

The site is situated in central Wythenshawe Town Centre, and overlooks a pedestrianised shopping street. Wythenshawe Interchange tram station is located approximately 100m to the west of site.

The immediate surrounding area consists of commercial uses with both empty and occupied retail and office spaces. The nearest identified sensitive receptors are residencies on Poundswick Lane approximately 180m to the north and residencies on Oatlands Road approximately 220m to the south.

The contextual site location is presented in Figure 1, with an approximate red line boundary and the nearest noise sensitive (residential) receptors shaded in blue.



Figure 1 - Site location with red line boundary and nearest residential receptors (blue)

3. ASSESSMENT POLICY & GUIDANCE

3.1 Introduction

This section sets out the policy and guidance which will inform the assessment which follows.

The assessment is, primarily, led by the requirements of the local planning authority – Manchester City Council – but reference to other applicable guidance documents and British Standards are also made.

3.2 Local Authority Guidance

Manchester City Council provides guidance for noise emissions from industrial/commercial developments in their 'Planning and Noise' Technical Guidance document dated October 2022.

The following objective targets are provided for planning for new noise generating development, based on the assessment approach of BS 4142 (summarised below).

For noise from industrial and commercial premises:

"The development should be designed so as to achieve a rating level of 5dB (L_{Aeq}) below the typical background (L_{A90}) level at the nearest noise sensitive location"

For noise from fixed plant/equipment:

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

The document also recommends that reference may also be made to the criteria for internal noise levels within dwellings that is provided in BS 8233:2014.

3.3 British Standards

3.3.1 BS 4142:2014+A1:2019 Methods of Rating and Assessing Industrial and Commercial Sound

BS4142:2014+A1:2019 primarily provides a numerical method by which to determine the significance of sound of an industrial nature (i.e. the 'specific sound' from the proposed development and/or existing source) at residential NSRs. The specific sound level may then be corrected for the character of the sound, if appropriate, and this is then termed the 'rating level' (denoted as $L_{Ar,Tr}$), whether or not a rating penalty is applied.

With regard to the rating correction, paragraph 9.2 of BS4142:2014+A1:2019 suggests the following subjective methods for the determination of the rating penalty for tonal, impulsive and/or intermittent specific sounds.

Table 1 – BS 4142 – Significant of Impact

Character	Significance of Impact
Tonality	For sound ranging from not tonal to prominently tonal the Joint Nordic Method gives a correction of between 0 dB and +6 dB for tonality. Subjectively, this can be converted to a penalty of 2 dB for a tone which is just perceptible at the noise receptor, 4 dB where it is clearly perceptible, and 6 dB where it is highly perceptible.
Impulsivity	A correction of up to +9 dB can be applied for sound that is highly impulsive, considering both the rapidity of the change in sound level and the overall change in sound level. Subjectively, this can be converted to a penalty of 3 dB for impulsivity which is just perceptible at the noise receptor, 6 dB where it is clearly perceptible, and 9 dB where it is highly perceptible.
Intermittency	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.
Other sound characteristics	Where the specific sound features characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied."

BS4142:2014+A1:2019 requires that the background sound levels adopted for the assessment be representative for the period being assessed. The Standard recommends that the background sound level should be derived from continuous measurements of normally not less than 15-minute intervals, which can be contiguous or disaggregated. However, the Standard states that there is no 'single' background sound level that can be derived from such measurements. The accompany not to paragraph 8.1.4 states that:

"A representative level should account for the range of background sound levels and should not automatically be assumed to be either the minimum or modal value."

Estimating Impact

An initial estimate of the impact of the specific sound is obtained by subtracting the measured background sound level from the rating level of the specific sound. In the context of the Standard, adverse impacts include, but are not limited to, annoyance and sleep disturbance.

Typically, the greater this difference, the greater the magnitude of the impact, while 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.

BS4142:2014 recommends the following scale to estimate the impact.

Table 2 – BS 4142 – Significant of Impact

Level Difference ($L_{Ar,Tr}$ vs $L_{AF90,T}$)	Significance of Impact
+10 dB	A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on context.
+5 dB	A difference of around +5 dB is likely to be an indication of an adverse impact, depending on context.
0 dB	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.

Whilst there is a relationship between the significance of impacts determined by the method contained within BS4142:2014+A1:2019 and the significance of effects described in the PPG-N, there is not a direct link. It is not appropriate to ascribe numerical rating / background level differences to LOAEL and SOAEL because this fails to consider the context of the sound which is a key requirement of the Standard.

The significance of the effect of the noise in question (i.e. whether above or below SOAEL and LOAEL) should be determined on the basis of the initial estimate of impact significance from the BS4142:2014 assessment with reference to the examples of outcome described within the PPG-N and after having considered the context of the sound. It is necessary to consider all pertinent factors, including:

- the absolute level of the sound;
- the character and level of the residual sound compared to the character and level of the specific sound; and
- the sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions such as:
 - façade insulation treatment;
 - ventilation and/or cooling that will reduce the need to have windows open so as to provide rapid or purge ventilation; and
 - acoustic screening.

4. ENVIRONMENTAL NOISE SURVEY

4.1 Methodology

An MZA Acoustics attended site on the 26th November 2024 to carry out an unattended 24Hr noise survey. Equipment was collected on 27th November 2024.

A noise monitor was extended from a first-floor window overlooking the pedestrianised High Street. An image showing the location of the noise monitor is presented below.



Figure 2-Noise monitoring location MP1

Following a site review the noise climate at this location was deemed to be representative of the wider area. The noise environment was considered to be dominated by pedestrian activity on the high street, distant road traffic and noise from tram passbys.

Wind was generally from the west or south throughout the survey, with windspeeds below 5 m/s.

There was no rain throughout the survey period.

4.2 Equipment

The following equipment was used to undertake the noise survey.

The sound level meters were calibrated prior to commencement, and upon completion, of the survey. No significant calibration drift was observed in any of the sound level meters.

Serial information for the equipment is given below in Table 3.

Table 3 – Equipment information

Equipment	Model	Serial Number	Last Calibrated
Sound Level Meter	01dB Metravib FUSION	11704	28/09/2023
Pre-amplifier	01dB Metravib PRE22	1707136	
Microphone	GRAS 40CD 1/22" Pre-polarised free-field	331728	
Calibrator	01dB Metravib CAL31	83395	07/05/2024

4.3 Survey Results

The table below presents the results of the noise survey. A full-time history is presented in Appendix F.

Table 4-Measured Noise Levels

Location	Period	Ambient Noise Level dB, $L_{Aeq,T}$	¹ Background Noise Level dB, $L_{A90,T}$
MP1	26/11/24 Daytime 12:15-23:00	54	42
	26/11/24 Night-Time 23:00-07:00	48	38
	27/11/24 Daytime 07:00-10:30	56	49

¹Background noise levels as per statistical analysis as shown in Appendix B

5. COMMERCIAL & EXTERNAL PLANT NOISE EMISSION LIMITS

5.1 Introduction

This section presents the noise emissions limits for commercial & external mechanical services plant associated with the development.

At this stage, final plant selections have not been made and, therefore, a detailed assessment cannot be undertaken. Nonetheless, it is recommended that these limits inform selections for plant at the design stages.

5.2 Nearest Noise Sensitive Receptors

The nearest noise sensitive receptors, to which noise emissions should be controlled, are presented in Figure 1 and consist of residencies on Poundswick Lane approximately 180m to the north and residencies on Oatlands Road approximately 220m to the south.

5.3 Noise Emission Limits

The noise emissions limits are based on the results of the environmental noise survey and the guidance provided by Manchester City Council.

Table 5 - Noise emissions limits in accordance with BS 4142

Location	Period	Background Sound Level dB L _{A90} (Measured/calculated as described above)	Noise Emission Limit dB L _{Ar, 7r}
Nearest Noise Sensitive Receptors	Daytime (07:00 – 23:00)	42	37
	Night-time (23:00 – 07:00)	38	33

The above levels apply to the cumulative noise emitted from all mechanical plant serving the development and, therefore, individual plant items will need to be designed to lower noise levels than those presented above.

6. **CONCLUSION**

MZA Acoustics has been appointed by Kier Construction. to provide an acoustic report to support the submission of the planning application for the site at Wythenshawe Civic Centre.

A baseline environmental noise survey has been undertaken at the site and is considered to be representative of the nearest identified noise sensitive receptors. The measured surey data has been used to set cumulative plant noise emission limits, which have been determined in accordance with the guidance from Manchester City Council.

This report is suitable for submission to the Local Planning Authority to agree operational plant noise limits.

The limitations of this report are presented in Appendix C.

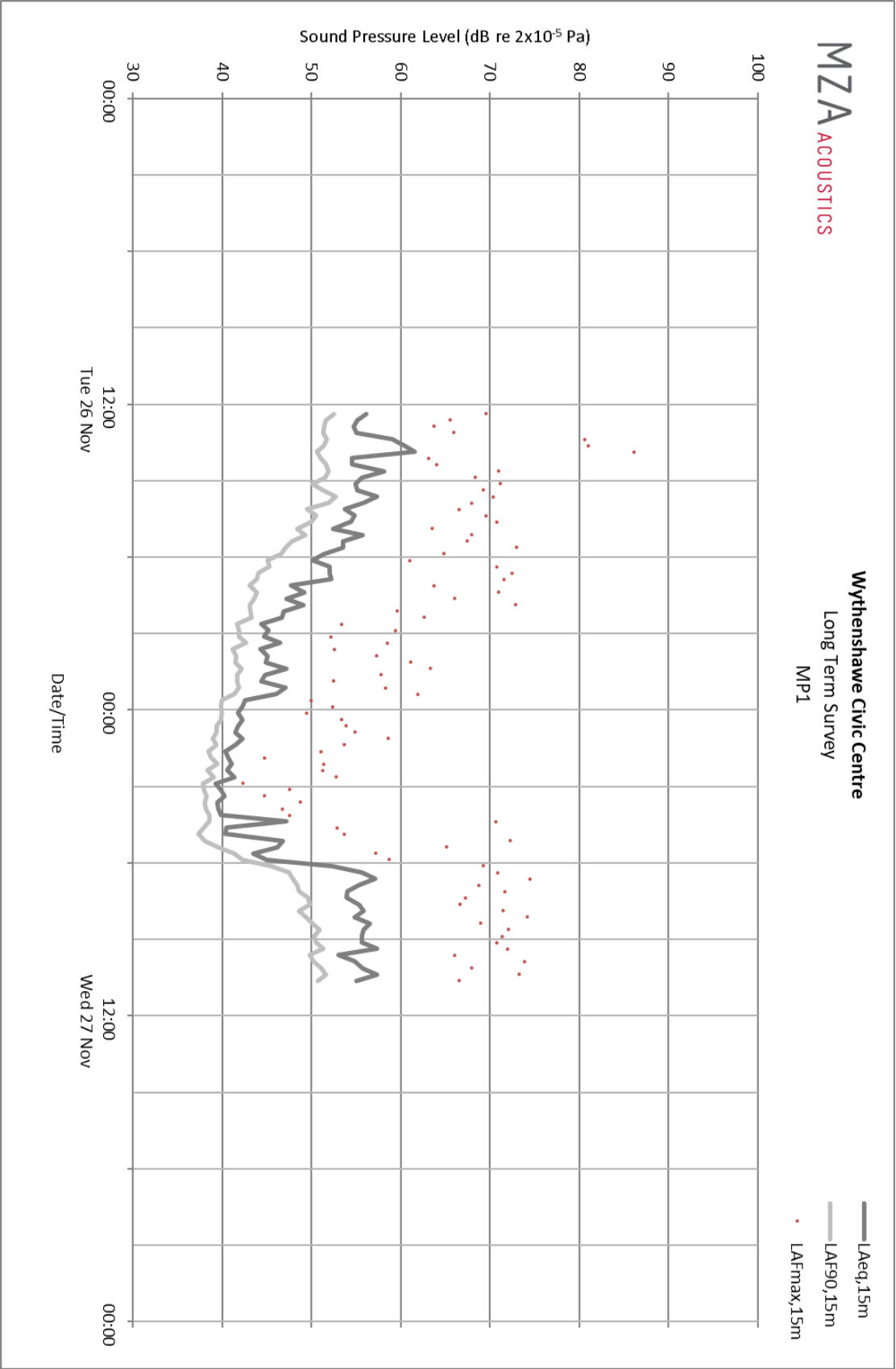
Appendices

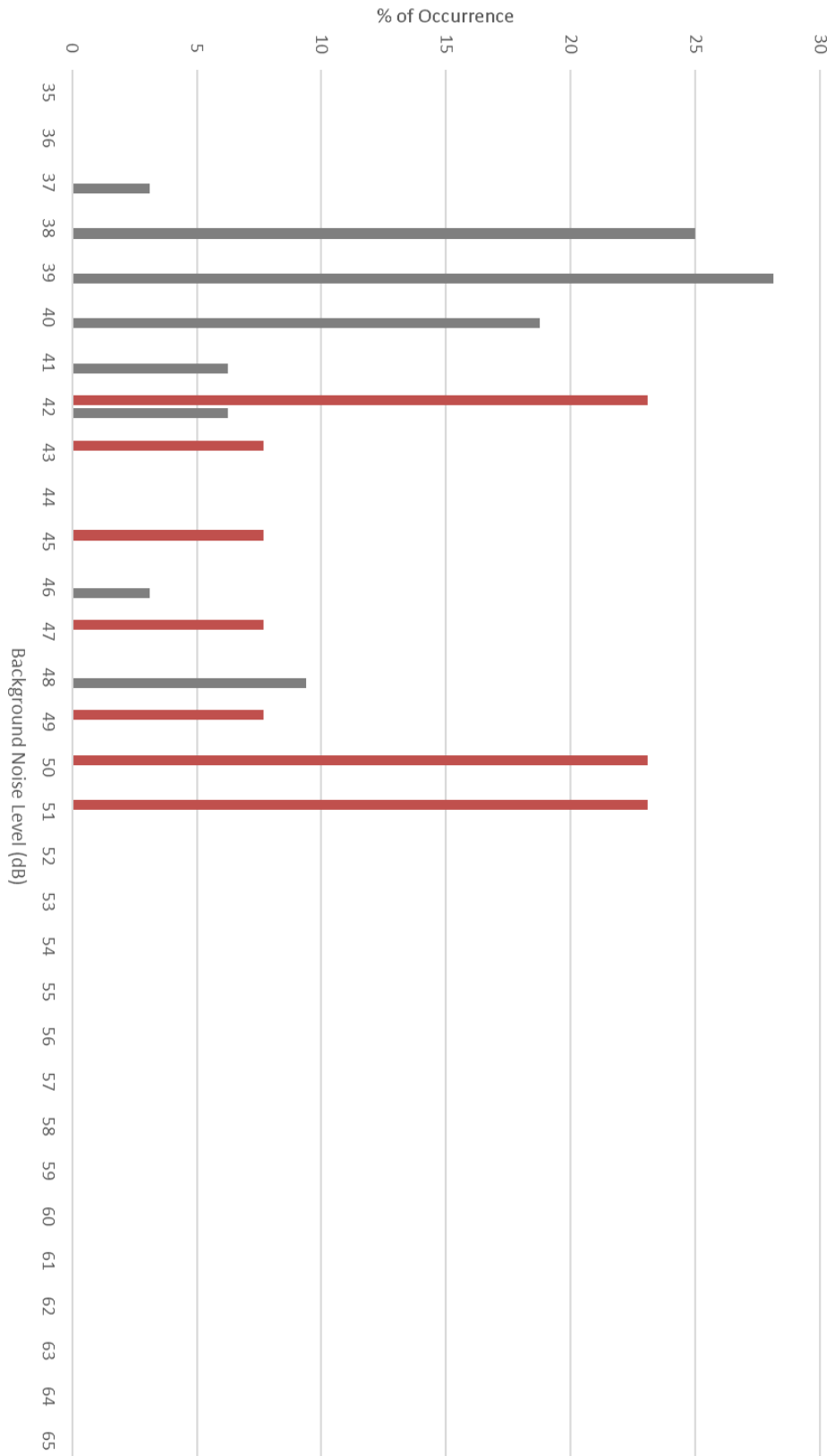
Appendix A – Glossary of Acoustic Terminology

Airborne Sound	Sound that reaches the point of interest by propagation through air.
Ambient Sound:	Sound from all sources at any given time, from both near and far. Usually measured in terms of L_{Aeq} .
A-Weighting	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.
Background Sound Level	The A-weighted sound pressure level that can be considered the baseline in the absence of any noise from a specific source of sound under assessment. Measured in terms of $L_{A90, T}$.
Calibration	The measurement system/ chain should be periodically calibrated, within a laboratory, against traceable calibration instrumentation, to either National Standards or as UKAS-Accredited, as required. The calibration of the system should also be checked in the field using a portable calibrator before and after each short-term measurement, and periodically for longer term monitoring.
Class 1	The Class of a sound level meter describes its accuracy as defined by the relevant international standards – Class 1 is more accurate than Class 2. The older standard IEC 60651 referred to the grade as "Type", whereas the new standard IEC 61672 refers to it as the "Class". The most accurate meters used in the field (as opposed to a laboratory) are Class 1. Class 2 meters can be used in some instances; however, MZA use Class 1 (or Type 1) meters by default, as required by BS 4142:2014, for example.
Decibel	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 20 Pa.
Fast time Weighting (F)	Averaging time used in sound level meters. Defined in BS EN 61672-2:2013 Electroacoustics. Sound level meters. Pattern evaluation tests.
Free-field / Façade	Far from the presence of sound reflecting objects (except the ground), usually taken to mean at least 3.5 m away.
IoA	The Institute of Acoustics is the UK's professional body for those working in acoustics, noise and vibration. It was formed in 1974 from the amalgamation of the Acoustics Group of the Institute of Physics and the British Acoustical Society (a daughter society of the Institution of Mechanical Engineers). It is a nominated body of the Engineering Council, offering registration at Chartered and Incorporated Engineer levels. MZA is a Sponsor Member of the Institute of Acoustics, and all our consultants/ engineers are individual Members.
$L_{AF90, T}$	The A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, T,

	measured using time fast time-weighting (F). Generally used to describe the 'background' sound conditions.
L_{AFmax}	The maximum A-weighted sound pressure level during a given time period. L _{max} is sometimes used for the assessment of occasional loud sounds, which may have little effect on the overall L _{eq} noise level but could still affect the sound environment. Unless described otherwise, it is measured using the fast time-weighting (F).
L_{eq, T}	A sound level index called the equivalent continuous sound 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. Where the value is A-weighted, it will be presented 'L _{Aeq,T} ' or 'dBA L _{eq,T} ', otherwise it should be an un-weighted (or linear) value.
L_p	See Sound Pressure Level.
Noise	Related to human response to sound. Unwanted sound, or sound that is considered undesirable or disruptive.
Octave Band	Frequency ranges in which the upper limit of each band is twice the lower limit. Octave bands are identified by their geometric mean frequency, or centre frequency.
Line Source	An idealised way of modelling a sound source, consisting of a uniform, flat plane.
Point Source	An idealised way of modelling a sound source, consisting of an infinitesimally small point, radiating sound equally in all dimensions
Sound Level Metrics	Sound levels usually fluctuate over time, so it is often necessary to consider an average or statistical sound level. This can be done in several ways, so a number of different metrics have been defined, according to how the averaging or statistics are carried out.
Sound Power	In a specified frequency band, the rate at which acoustic energy is radiated from a source. In general, the rate of flow of sound energy, whether from a source, through an area, or into an absorber.
Sound Power Level	Of airborne sound, ten times the common logarithm of the ratio of the sound power under consideration of the standard reference power of 1 pW. Expressed in decibels.
Sound Pressure	Sound, or sound pressure, is a fluctuation in air pressure over the static ambient pressure.
Sound Pressure Level	The sound level is the sound pressure relative to a standard reference pressure of 20 Pa (20x10 ⁻⁶ Pascals) on a decibel scale.
Specific Sound	The sound source being assessed in a BS 4142:2014 assessment.
UKAS	United Kingdom Accreditation Service, recognised by government to assess organisations that provide certification, testing, inspection and calibration services against internationally agreed standards.

Appendix B – Environmental Noise Survey Results





Appendix C - Limitations to this Report

This report has been prepared for the titled project or named part thereof and should not be used in whole or part and relied upon for any other project without the written authorisation of MZA Acoustics Limited. MZA Acoustics Limited accepts no responsibility or liability for the consequences of this document if it is used for a purpose other than that for which it was commissioned. Persons wishing to use or rely upon this report for other purposes must seek written authority to do so from the owner of this report and/ or MZA Acoustics Limited and agree to indemnify MZA Acoustics Limited for any and all loss or damage resulting therefrom. MZA Acoustics Limited accepts no responsibility or liability for this document to any other party other than the person by whom it was commissioned.

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. Opinions included therein are based on information gathered during the study and from our experience. If additional information becomes available which may affect our comments, conclusions or recommendations MZA Acoustics Limited reserve the right to review the information, reassess any new potential concerns and modify our opinions accordingly.

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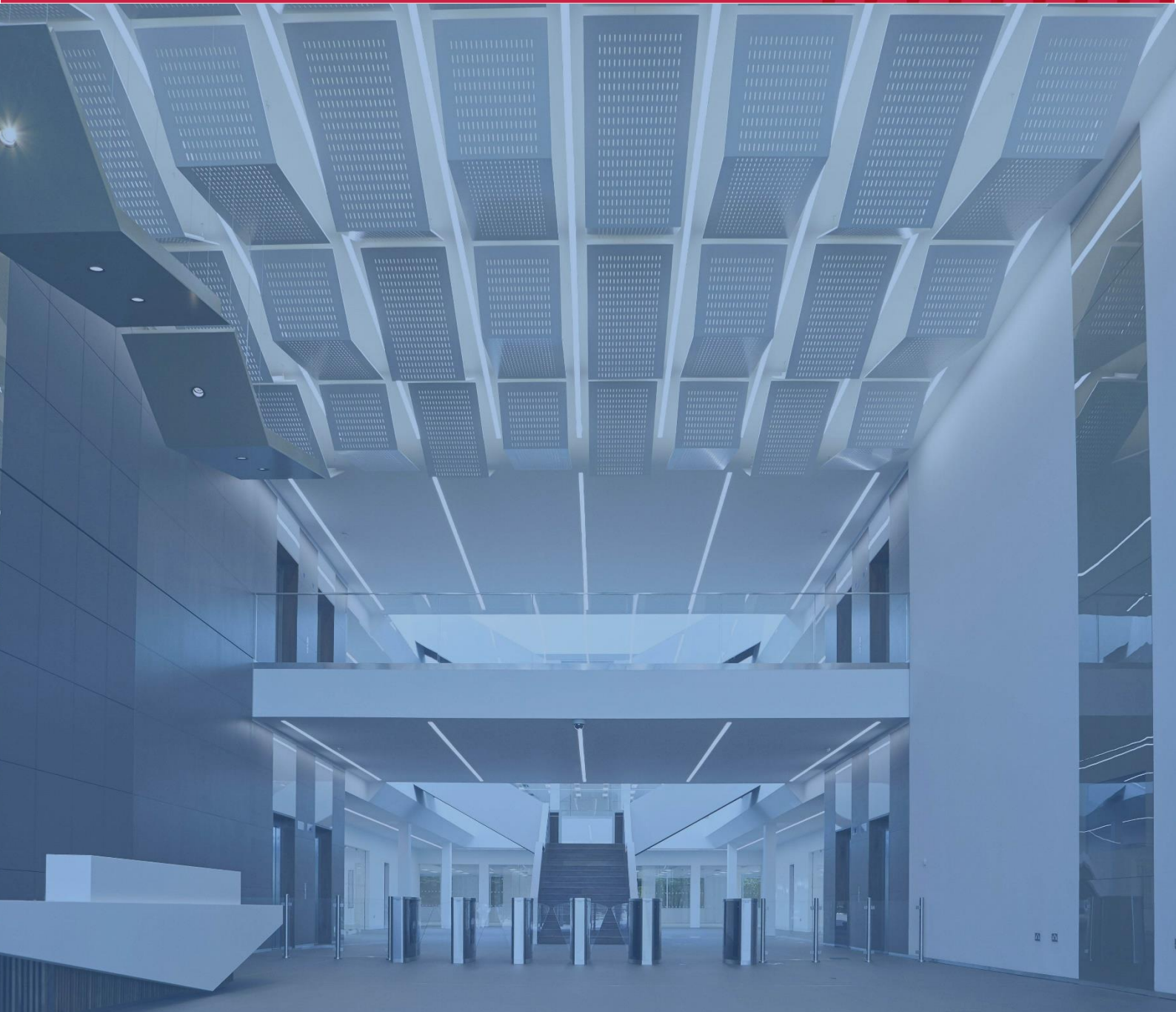
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