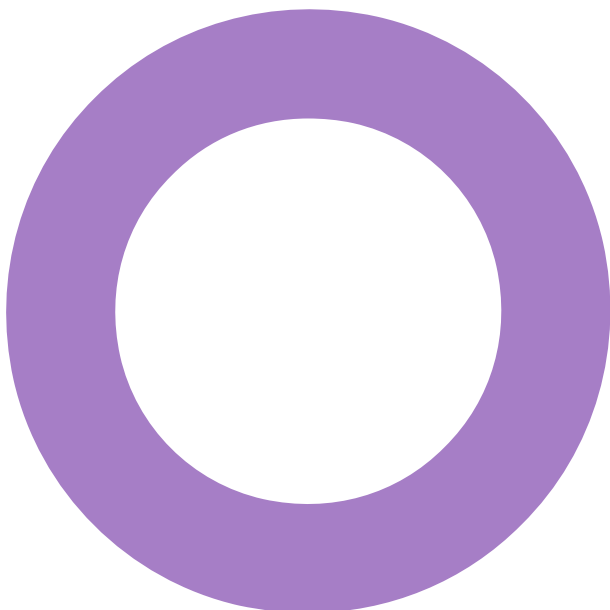


**Impossible.
Manchester.
FACT251 LTD.**

ACOUSTICS

NOISE ASSESSMENT REPORT

REVISION 01 – 18 JANUARY 2023



Audit sheet.

Rev.	Date	Description of change / purpose of issue	Prepared	Reviewed	Authorised
01	18-01-2023	First issue.	SG	AP	PM

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Executive summary.

Hoare Lea has been appointed to provide acoustic advice for the proposed extension to Impossible Bar, Peter Street, Manchester.

An environmental noise survey has been carried out in the vicinity of the site and the nearest noise sensitive premises to determine the existing background sound levels in the area.

With reference to MCC's requirements, entertainment noise egress shall be controlled to ensure the octave band sound pressure levels at 1 m from the façade of the nearest noise sensitive premises do not exceed the levels presented.

Based on the assessment undertaken, the permissible sound levels within the extension will need to be quieter than the sound levels within the existing bar area to achieve the MCC requirement. As guidance, the permissible sound levels correspond to operational conditions as presented below:

- The extension usage with quiet background music local to the seats is considered to be acceptable during all periods the space is proposed to operate (12:00-00:00).
- During periods where louder music with bass control is proposed, windows and doors are to remain closed. The music noise level under this condition should still be limited such that occupants are likely to clearly hear the music but are not required to shout to be heard.

This is understood to be in line with the proposed operation of the extension.

1. Introduction.

Hoare Lea has been appointed by FACT251 Ltd, on behalf of Impossible Manchester, to provide acoustic advice for the proposed extension to Impossible Bar, Peter Street, Manchester.

An environmental noise survey has been carried out between Thursday 5th January 2023 and Monday 9th January 2023 to determine the existing noise levels in the vicinity of the site, including ambient and background sound levels. From this, appropriate noise egress limits for entertainment noise associated with the development have been determined.

An assessment has been undertaken, considering the noise level at the closest noise-sensitive receptors from normal activities within the bar.

2. Site and development details.

2.1 Site location.

The proposed development site is located to the rear of the existing Impossible Bar building, facing Great Northern Square, a public plaza within Manchester city centre. Impossible Bar is on the corner of Peter Street and Watson Street within central Manchester.

The site location is indicated in Figure 1. The area of the extension is currently external seating associated with the bar.

2.2 Development details.

The proposed development comprises a glazed lean-to extension to the existing building. The existing building façade is proposed to be retained throughout.

The current operating hours of the bar are to remain as stated below:

Day	Opening hours
Monday	Closed
Tuesday	12:00 – 00:00
Wednesday	12:00 – 00:00
Thursday	12:00 – 00:00
Friday	12:00 – 04:00
Saturday	12:00 – 04:00
Sunday	12:00 – 01:00

Table 1: Operating hours of Impossible Bar.

The new extension is proposed to be vacated at 00:00 each day, with music to stop playing in the area at 22:00. There will be no DJs or Bands in this area, but small zonal speakers are proposed to be located near the seating areas for background music.

The glazing and roof may be open during daytime hours but will be closed at 22:00 each day. The proposed glazing to the walls, doors, and roof is 10 mm toughened glass.

No new plant equipment is proposed as part of the extension works.

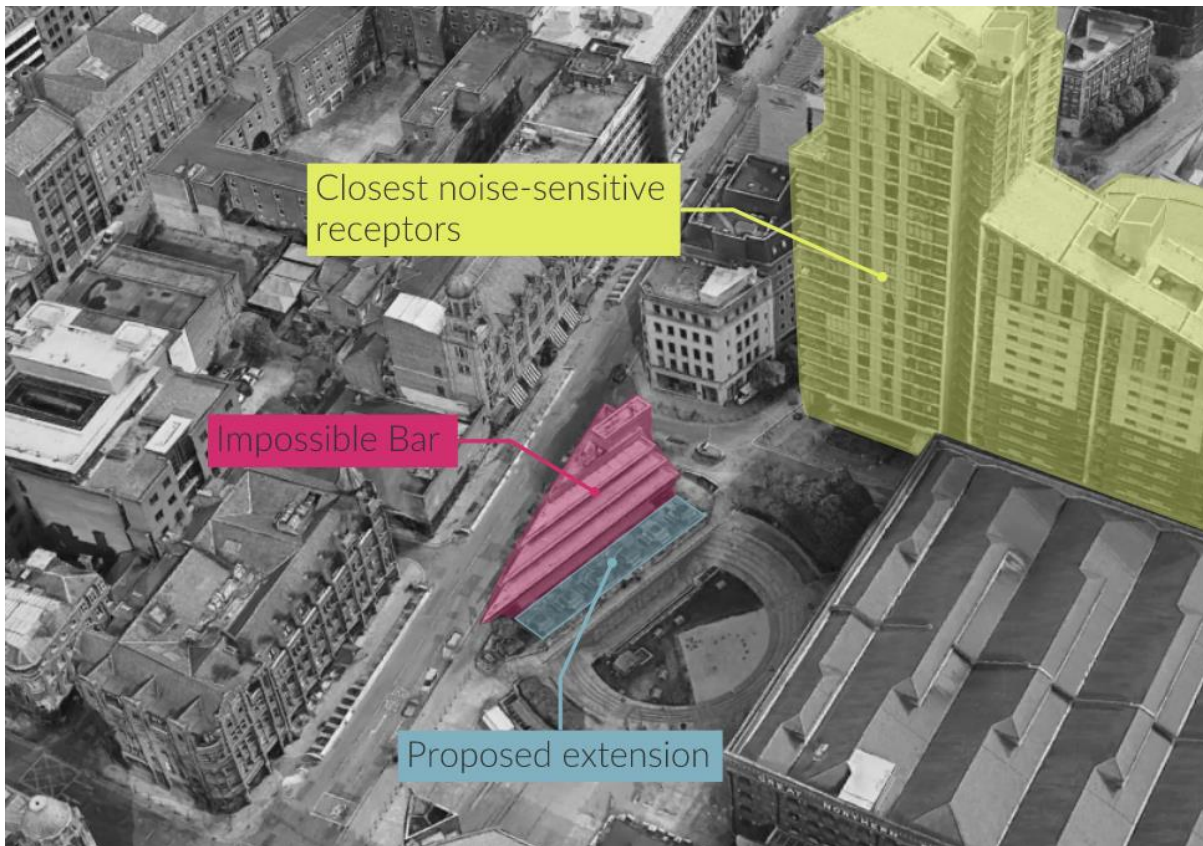


Figure 1: 3D rendered image showing development location and context (courtesy of Google Earth).

2.3 Surrounding area.

The site is located within a primarily commercial area, with Peter Street primarily accommodating bars, restaurants, retail, and offices. The worst affected noise-sensitive premises are considered to be the apartments on Watson Street, approximately 24 metres to the south east of the proposed extension.

2.4 Local noise climate.

During the daytime, the existing local noise climate is dominated by road traffic along Peter Street and Deansgate, as well as existing roof mounted plant at Impossible Bar and the nearby buildings. There are no trams or trains within the local vicinity of the site and therefore these do not significantly contribute to the noise climate.

During evening and weekend periods, the local noise climate is dominated by noise from the nearby bars and entertainment venues into the early hours of the morning.

3. Policy and guidance.

3.1 Policy and guidance documents.

The following policy and guidance documents have been reviewed when preparing this report:

National policy.

- Noise Policy Statement for England.
- National Planning Policy Framework.
- Planning Practice Guidance.

Local policy.

- Manchester City Council Planning & Noise Technical Guidance (October 2022)

Recognised guidance.

- British Standard 4142: 2014 Methods for rating and assessing industrial and commercial sound.

A review and expanded description of the documents has been included within Appendix A.

3.2 Local Authority consultation.

The Local Authority have requested the following to be carried out in relation to the proposed extension:

'An acoustic study is required identifying ambient noise levels during daytime, night time and weekends along with an indication of noise levels that you propose to achieve within the accommodation and details of the acoustic glazing and acoustically treated ventilation you propose to use.'

4. Environmental noise survey.

4.1 Method.

An environmental noise survey has been undertaken at the development site. This included long-term unattended monitoring at roof level, and short-term attended measurements within the existing bar. Full details and methodology are provided within Appendix B.

The noise survey was carried out between Thursday 5th January 2023 and Monday 9th January 2023 to determine the existing noise levels in the vicinity of the site, including ambient and background sound levels.

The unattended survey position is summarised in the annotated 3D rendered image presented in Figure 2.

There were limited periods of inclement weather during this period, as well as periods where the noise climate was dominated by nearby mechanical plant related to the Impossible Bar. These periods were omitted from the assessment.

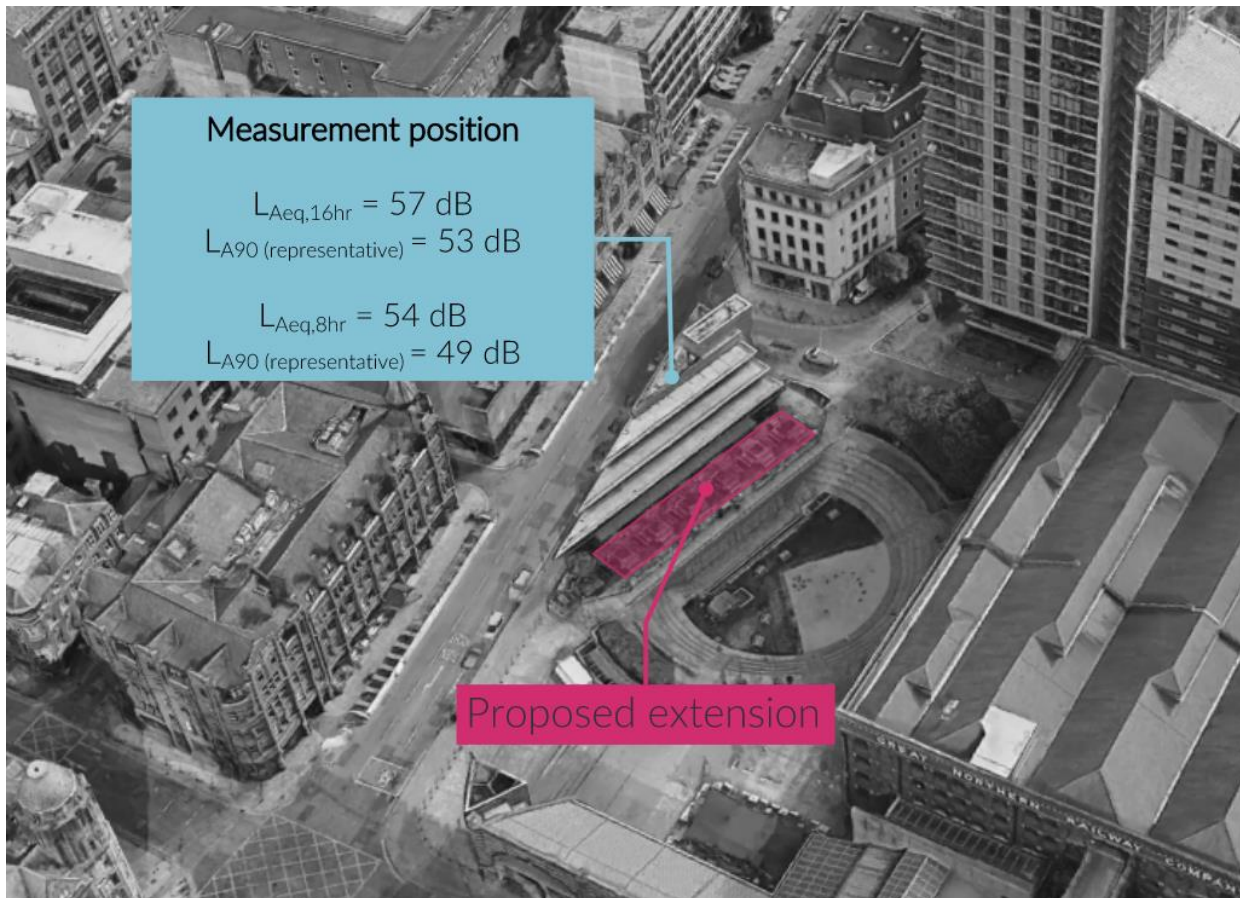


Figure 2: Annotated 3D rendered image indicating measurement position (courtesy of Google Earth).

4.2 Observations.

The dominant noise source was road traffic noise along Peter Street and Deansgate.

During the evening, low frequency entertainment noise egress and general people noise associated with nearby entertainment venues was audible.

4.3 Background sound levels for setting noise limits.

To assess noise breakout from activity within the new extension, the minimum background sound level in octave band resolution is presented below for the hours of operation (12:00-00:00):

Frequency	63	125	250	500	1k	2k	4k	8k	Hz
Minimum background sound level, $L_{90,T}$	61	55	49	49	49	44	37	26	dB

Table 2: Minimum measured background sound level in octave band resolution during hours 12:00-00:00.

4.4 Attended measurement results.

Attended measurements were undertaken within the existing bar area. It is understood that the sound system was operating as is typical for busy evening periods during the measurements.

Frequency	63	125	250	500	1k	2k	4k	8k	Hz
Measurement captured within existing bar, $L_{eq,30sec}$	89	84	80	80	78	76	71	60	dB

Table 3: Summary of results obtained from attended internal noise measurements.

5. Entertainment noise emissions.

5.1 Noise limits.

Based on MCC's criteria set out in Appendix A and the survey results, the maximum sound pressure levels from amplified entertainment noise shall not exceed the octave band levels presented in Table 4 at 1 m from the nearest noise sensitive premises.

These limits have been derived from the lowest octave band background sound levels captured within the noise survey during the hours the extension is proposed to be open (12:00-00:00). Due to the evening activity local to the venue, the background sound level does not change significantly throughout this period, so a single limit is considered to be appropriate.

Frequency	63	125	250	500	1k	2k	4k	8k	Hz
Maximum permissible sound level at the nearest noise-sensitive premises, $L_{eq,T}$	56	50	44	44	44	39	32	21	dB

Table 4: Maximum permissible sound pressure levels due to entertainment noise at 1 m from the nearest noise sensitive premises.

5.2 Proposed building envelope.

The building envelope is proposed to comprise 10 mm toughened glass for the full area of external walls and roof. Based on historic data for similar glazing, the following sound insulation performance has been assumed:

Frequency	63	125	250	500	1k	2k	4k	8k	Hz
Sound reduction index, R	22	28	26	32	31	34	43	43	dB

Table 5: Assumed sound insulation performance of external glazing.

5.3 Assessment.

It is understood that the extension is proposed to incorporate localised, zonal speakers close to seating areas. Two conditions have been considered:

- Condition 1: Quiet background music local to the seats only.
- Condition 2: Some music in the space with bass control. Occupants likely to clearly hear the music but are not required to shout to be heard.

As the doors and windows are proposed to be open during some periods, an assessment has been carried out with all windows and doors open as a worst-case, and another assessment with all windows and doors closed.

The assessment includes the sound reduction of the proposed glazing (Table 5) and attenuation due to distance between the proposed extension and the façade of the closest apartments.

Based on archive data from similar bar operations, a representative internal noise spectrum for the conditions presented above would be as presented in Table 6.

Frequency	63	125	250	500	1k	2k	4k	8k	Hz
Condition 1 – Quiet background music local to the seats only	70	64	63	64	64	59	52	41	dB
Condition 2 – Some music in the space with bass control	71	70	76	83	82	78	70	58	dB

Table 6: Archive data for operations considered representative of proposed usage of extension.

The values presented in Table 6 are lower than the sound levels measured within the existing bar area, but these are understood to be in line with the intended operation of the space.

The results of the assessment are presented below:

- The sound levels presented as Condition 1 (quiet background music local to the seats only) achieves the MCC planning criteria when all windows and doors are open or closed, so would meet the criteria during all periods.
- The sound levels presented as Condition 2 (some music in the space with bass control), achieves the MCC planning criteria only when all windows and doors are closed.

On the basis of the above, the extension usage with quiet background music local to the seats (i.e. Condition 1) is considered to be acceptable during all periods the space is proposed to operate (12:00-00:00). During periods where louder music with bass control is proposed (i.e. Condition 2), windows and doors are to remain closed.

Appendix A: Recognised policy and guidance.

National policy.

Noise Policy Statement for England.

The *Noise Policy Statement for England* (NPSE) advises that noise impacts should be assessed on the basis of adverse and significant adverse effects but does not provide any specific guidance on assessment methods or noise limits.

The NPSE introduces the concepts summarised in Table 7 that can be applied when considering the significance of noise impacts, which are applied by the World Health Organization.

The document advises that it is not possible to have '*a single objective noise based measure.... that is applicable to all sources of noise in all situations*'. It further advises that the sound level at which an adverse effect occurs is likely to be different for different noise sources, for different receptors at different times.

Effect Level 1	Description
No Observed Effect Level (NOEL)	This is the noise level below which no effect can be detected. In simple terms, below this level of noise, there is no detectable effect on health and quality of life due to the noise being assessed.
Lowest Observed Adverse Effect Level (LOAEL)	This is the level of noise above which adverse effects on health and quality of life can be detected.
Significant Observed Adverse Effect Level (SOAEL)	This is the level of noise above which significant adverse effects on health and quality of life occur.

Table 7: NPSE observed effect levels.

National Planning Policy Framework.

National Planning Policy Framework (NPPF) sets out the Government's planning policies and how these are expected to be applied. In relation to noise and vibration, NPPF section 15 paragraphs 170, 180 and 182 are presented below:

'170. Planning policies and decisions should contribute to and enhance the natural and local environment by:

e. 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, air, water or noise pollution or land instability'

'180. 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:

- 1. 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;*
- 2. 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

- 3. limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.*

'182. Planning policies and decisions should ensure that 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.'

Planning Practice Guidance.

Online Planning Practice Guidance (PPG) has been published to provide greater details in relation to the relevance of noise to the planning process following the introduction of the NPPF and NPSE.

This guidance states, under the heading '*How to Determine the Noise Impact*', that the following should be considered by Local Authorities:

- *'whether or not a significant adverse effect is occurring or likely to occur;*
- *whether or not an adverse effect is occurring or likely to occur; and*
- *whether or not a good standard of amenity can be achieved.'*

In line with NPSE, this includes identifying where noise exposure is above or below the significant observed adverse effect level and the lowest observed adverse effect level for a given situation during the operation of the Proposed Development.

Further guidance on each of the various observed effect levels set out in the NPSE is provided in the table detailed in the section headed 'How to Recognise when Noise could be a concern?' which is reproduced in Table 8.

It is important to note that no specific noise parameters are defined in the text or target noise levels provided. Under the heading 'What factors influence whether noise could be a Concern?', the subjective nature of noise is discussed. It is stated that there is no simple relationship between noise levels and the impact on those affected. This depends on how various factors combine in particular situations.

In respect of mixed-use developments, the following guidance is provided:

'When proposed developments could include activities that would be covered by the licensing regime, local planning authorities should consider whether the potential for adverse noise impacts will be addressed through licensing controls (including license conditions). Local planning authorities should not however presume that license conditions will provide for noise management in all instances and should liaise with the licensing authority.'

Perception	Example of outcomes	Increasing effect level	Action
Not noticeable	No effect	No Observed Effect	No specific measures required
Noticeable and not Intrusive	Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.		No specific measures required
		Lowest Observed Adverse Effect Level	
Noticeable and Intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; closing windows for some of the time because of the noise. Potential for non-awakening sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
		Significant Observed Adverse Effect Level	
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. having to keep windows closed most of the time, avoiding certain activities during periods of intrusion. 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 Level	Avoid
Noticeable and disruptive	Extensive and regular changes in behaviour and/or inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

Table 8: PPG observed effects.

Local policy.**Manchester City Council Planning & Noise Technical Guidance.**

Criteria for plant noise egress and entertainment noise egress is provided in the MCC “Planning & Noise Technical Guidance (October 2022)” document. This is referenced in the subsequent section.

Entertainment noise egress.

With regards to entertainment noise, MCC stipulate the following:

'A planning application for a new entertainment venue that is structurally detached from other building uses should demonstrate that music noise from the proposal will not be 'audible' in nearby residential properties, assuming that the residential properties in question have their windows open. The criterion here is:

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'.

Recognised guidance.

British Standard 4142.

Current Government advice to Local Planning Authorities in both England and Wales refers to British Standard 4142:2014 (BS 4142) as being the appropriate guidance for assessing commercial operations and fixed building services plant noise. The British Standard provides an objective method for rating the significance of impact from industrial and commercial operations. It describes a means of determining sound levels from fixed plant installations and determining the background sound levels that prevail on a site.

The assessment of the impacts is based on the subtraction of the pre-existing background sound level ($L_{A90,T}$) from the rating level ($L_{Ar,Tr}$).

The standard does not give a definitive method for determining the background sound level but instead, as a commentary, states that *"the objective is not simply to ascertain a lowest measured background sound level, but rather to quantify what is typical during particular time periods"*.

Clause 8.1.4, which discusses the monitoring duration, states *"there is no 'single' background sound level as this is a fluctuating parameter. However, the background sound level used for the assessment should be representative of the period being assessed."* As a note to this clause the following commentary is given on obtaining a representative background sound level:

"To obtain a representative background sound level a series of either sequential or disaggregated measurements ought to be carried out for the period(s) of interest, possibly on more than one occasion. A representative level ought to account for the range of background sound levels and ought not automatically to be assumed to be either the minimum or modal value."

The rating level is defined objectively as the specific source noise level in question (either measured or predicted) with graduated corrections for tonality (up to +6 dB(A)), impulsivity (up to +9 dB(A)), intermittency (+3 dB(A)) and other sound characteristics (+3 dB(A)) which may be determined either subjectively or objectively, if necessary.

The background sound level is subtracted from the rating level. The following is considered when evaluating the potential impact:

- A difference of around +10 dB is likely to be an indication of a significant adverse impact, depending on context;
- A difference of around +5 dB is likely to be an indication of an adverse impact, depending on context; and
- A difference of +0 dB or less is an indication of the specific sound source having a low impact, depending on the context.

It also states *'where background sound levels and rating levels are low, absolute levels might be as, or more, relevant that the margin by which the rating level exceeds the background. This is especially true at night.'*

Appendix B: Survey and equipment details.

An environmental noise survey has been undertaken at the development site. This included long-term unattended logging at one external position, and short-term attended measurements within the existing bar area at Impossible Manchester. The unattended logger position is presented in Figure 2.

All measurements are considered free field as they were taken more than 3.5 metres from any acoustically reflecting surface other than the ground and were at a height of approximately 1.4 metres above roof level.

Long-term unattended survey.

An unattended noise survey has been carried out between Thursday 5th January 2023 and Monday 9th November 2023. The logger recorded 15-minute duration samples of ambient sound levels ($L_{Aeq,15min}$), and background sound levels ($L_{A90,15min}$) throughout this period.

During the survey period, there were periods of high wind speed, on the Friday and Saturday in particular. There were also periods where mechanical plant close to the measurement position was operational, giving artificially high results. These periods have been omitted from the results, and the absolute minimum background sound levels have been used within the assessment as a worst-case.

Attended survey.

Attended noise measurements have been undertaken on Thursday 5th January 2023 to capture the typical music noise levels within the main bar area as it currently operates.

Measurement instrumentation.

The measurement instrumentation used for each survey is listed below:

- Sound Level Meter, logger position
 - Rion Type NL-52 Sound Level Meter (Serial Number 00732162)
 - Rion Type NH-25 Pre-Amplifier (Serial Number 32190)
 - Rion Type UC-59 Microphone (Serial Number 16798)
- Sound Level Meter, internal measurements
 - Brüel & Kjær Type 2250 Sound Level Meter (Serial Number 3003815)
 - Brüel & Kjær Type ZC 0032 Pre-Amplifier (Serial Number 29116)
 - Brüel & Kjær Type 4189 Microphone (Serial Number 2887159)
- Sound Calibrator, all positions
 - Brüel & Kjær Type 4231 Sound Calibrator (Serial Number 2545611)

The equipment was calibrated before and after the measurement periods, and no significant drift was detected.



Figure 3: Photograph of the logger position.

Survey results.

A summary of the results of the unattended measurements is presented in Table 9. A time history has been presented in Figure 5.

Measurement Date	Ambient sound level, $L_{Aeq,T}$	
	Daytime (0700-2300) ^[1]	Night-time (2300-0700) ^[1]
Thursday 5 th January 2023	62 dB	56 dB
Friday 6 th November 2023	57 dB	54 dB
Saturday 7 th November 2023	56 dB	54 dB
Sunday 8 th November 2023	57 dB	55 dB
Monday 9 th November 2023	58 dB	-
Typical	57 dB	54 dB

Notes:
^[1] Measurements across all days were impacted by local mechanical plant operation and by occasional inclement weather. The periods impacted have been omitted from the results.

Table 9: Summary of results at logger position.

In line with the guidance within BS 4142, a statistical analysis of the measured background sound levels has been presented in Figure 4.

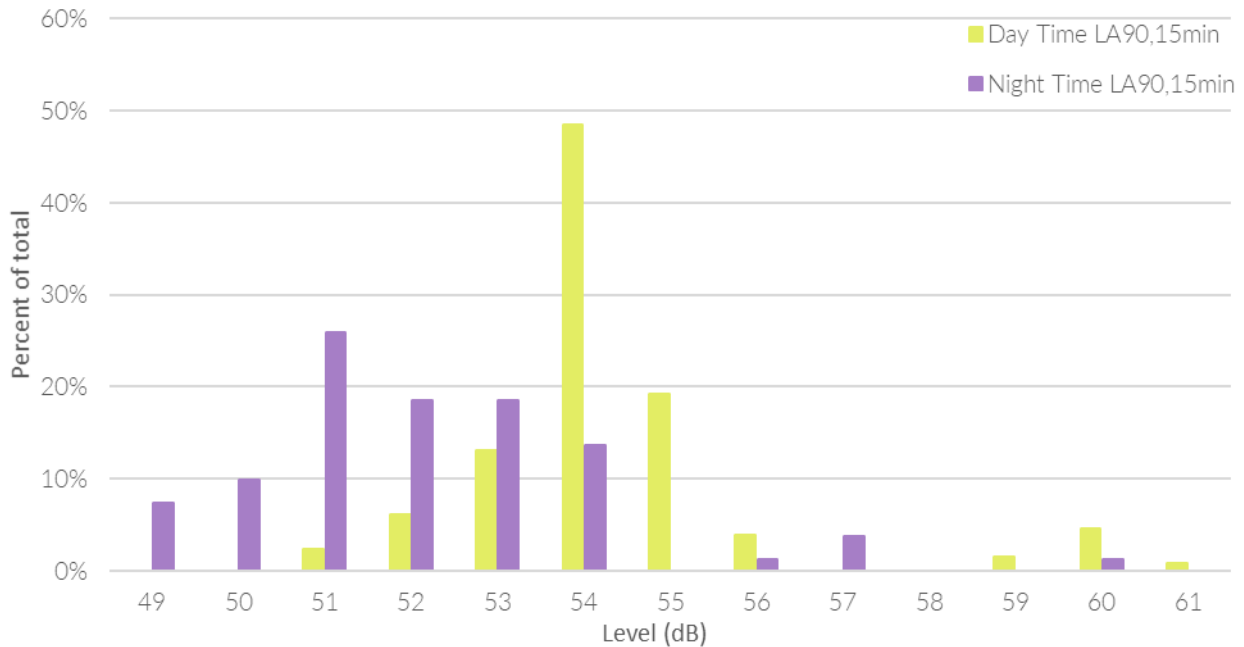


Figure 4: Statistical analysis of background sound levels captured at logger position.

The typical background sound level considered to be representative of the closest noise-sensitive receptors is presented below on this basis:

- Daytime background sound level: **53 dB LA90,5min**
- Night-time background sound level: **49 dB LA90,5min**

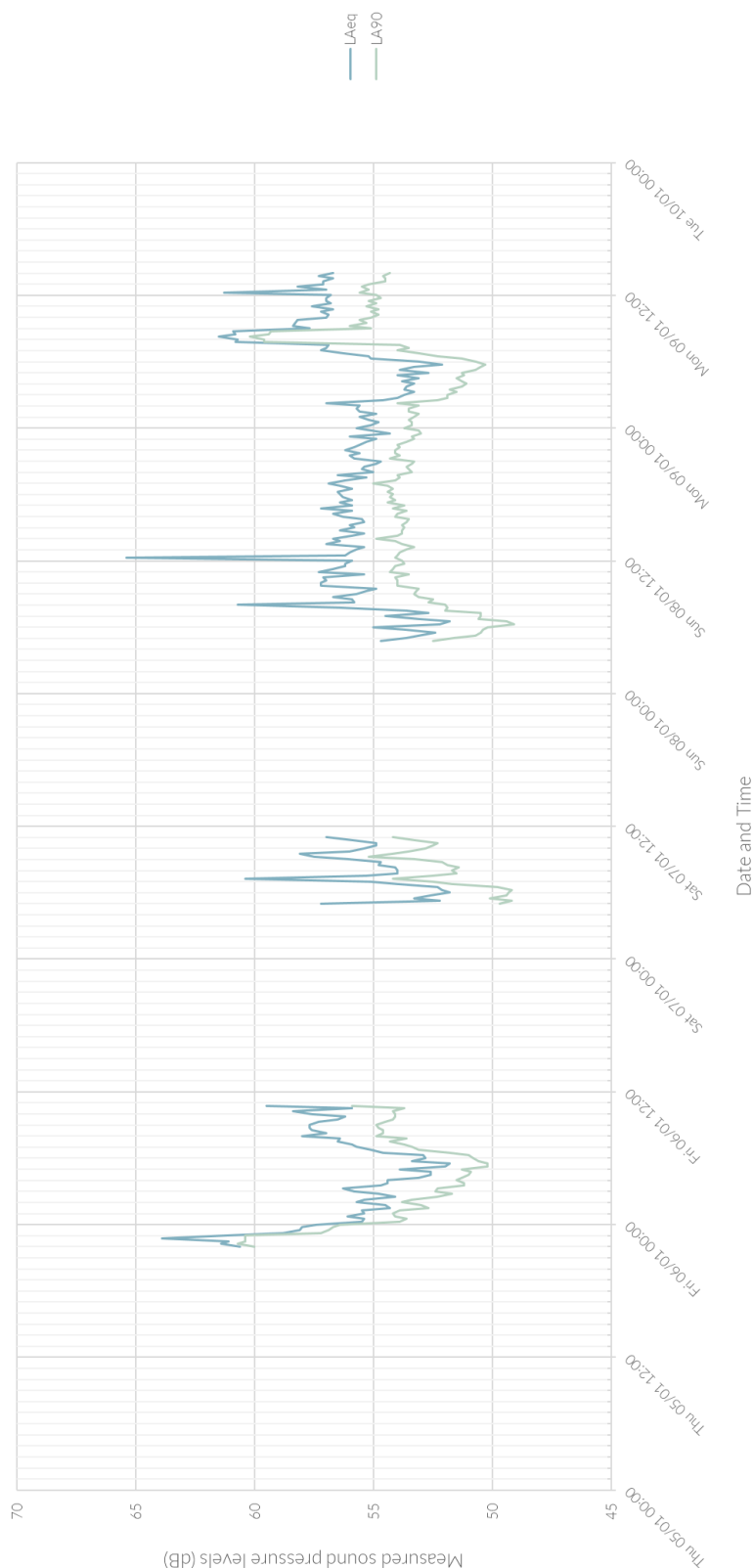


Figure 5: Time history of unattended noise logger.



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