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Consultants in Acoustics, Noise & Vibration

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Moxy Hotel, Spinningfields

Planning noise report

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Summary

Sandy Brown has been commissioned KE Hotels Manchester LTD to provide an assessment of noise in relation to the proposed 3 storey extension at Moxy Hotel, Spinningfields.

An environmental noise survey has been carried out at the site. The noise survey was carried out between 6 September 2024 and 10 September 2024.

Representative background sound levels measured during the survey were $L_{A90,15min}$ 54-57 dB during the day and $L_{A90,15min}$ 47-48 dB at night.

Based on the requirements of the Manchester City Council and on the results of the noise survey, all plant must be designed such that the cumulative noise level at 1 m from the worst affected windows of the nearby noise sensitive premises does not exceed $L_{Aeq,15min}$ 49 dB during the day and $L_{Aeq,15min}$ 42 dB during the night.

All building services plant will be designed to achieve the noise limits set out above, including any corrections for attention catching features. At this stage, no information is available in relation to the proposed plant. This will need to be assessed as the design progresses.

The average ambient noise levels measured during the survey were $L_{Aeq,16h}$ 60-62 dB during the day and $L_{Aeq,8h}$ 59-60 dB at night.

Analysis of night-time maximum noise levels indicates that the night-time maximum noise level not normally exceeded 10 times a night is L_{AFmax} 83 dB.

An initial assessment has been carried out to determine required acoustic performances for the facades and provide guidance on the ventilation strategy. Standard thermal double glazing with mechanical ventilation is expected to be suitable to control environmental noise ingress to meet the Moxy hotel standards throughout.

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1 Introduction

Sandy Brown has been commissioned KE Hotels Manchester LTD to provide an assessment of noise in relation to the proposed 3 storey extension at Moxy Hotel, Spinningfields.

An environmental noise survey has been carried out to establish:

- background sound levels around the site and by nearby noise sensitive premises
- ambient and maximum noise levels at the site.

The background sound levels measured during the survey are used as the basis for setting limits for noise emission from proposed building services plant. These limits are set in accordance with the requirements of the Manchester City Council.

Ambient and maximum noise levels are used to assess building envelope sound insulation requirements to achieve appropriate internal noise levels in line with the Moxy hotel standards.

This report provides details of the noise survey, including measurement results, and provides recommendations.

2 Site description

2.1 The site and its surroundings

The site location in relation to its surroundings is shown in Figure 1.

The site is located in Manchester city centre, and currently contains the 9-floor Moxy Hotel, Spinningfields. It is bounded by Atkinson Street to the south, 1 Hardman Street to the north, 184-186 Deansgate to the east, and 3 Hardman Street to the west.



Figure 1 Aerial view of the site (Google Earth Pro)

2.2 Adjacent premises

The surrounding area comprises mainly office and commercial premises. The nearest offices are located at Sunlight House (highlighted in yellow in Figure 1) and 196 Deansgate (orange) to the south, 3 Hardman Street (green) to the west and 1 Hardman Street (blue) to the north.

It is understood that some rooms for residential purposes are located within the Oddfellows offices on the Deansgate side of The Courthouse Building, located approximately 20 m to the east at 184-186 Deansgate. These rooms are completely screened from the development site by The Courthouse Building (highlighted in red in Figure 1).

3 Development proposals

The proposals for this development are a 3-storey extension to the building to provide around 50 additional hotel rooms.

It is understood that building services plant will be the main noise source with potential for impact on existing noise sensitive receptors.

The potential impact of building services plant has been assessed and mitigation measures have been proposed to minimise impact on existing noise sensitive premises around the development.

4 Assessment criteria

4.1 NPPF and NPSE

The National Planning Policy Framework, December 2023 (NPPF) sets out the UK government's planning policies for England. It supersedes previous guidance notes such as PPG24. No specific noise criteria are set out in the NPPF, or in the Noise Policy Statement for England (NPSE) to which it refers.

The NPPF, clause 191 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:*
>
> - *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.*
> - *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 clause 193 states:

> *'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.'*

The NPSE states that its aims are as follows:

> *'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.'*

As such, neither document sets out specific acoustic criteria for new developments, but they require consideration of the effect of existing noise on the new development and the effect of noise from the development on the surroundings.

4.2 ProPG

ProPG *Planning & Noise (Professional Practice Guidance on Planning & Noise), New Residential Development, 2017* provides guidance to the management of noise within the planning system in England. It is restricted to consideration of new residential developments that will be exposed predominantly to airborne noise from transport sources.

The two stages of the approach are given below

- Stage 1 – Initial noise risk assessment of the proposed development site
- Stage 2 – Systematic consideration of four key elements
    - Element 1 – Demonstrating a ”Good Acoustic Design Process”
    - Element 2 – Observing internal “Noise Level Guidelines”
    - Element 3 – Undertaking an “External Amenity Area Noise Assessment”
    - Element 4 – Consideration of “Other Relevant Issues”.

Following this approach, there are four possible recommendations, the choice of recommendation is as follows:

- Grant without conditions
- Grant with conditions
- Avoid
- Prevent.

Guidance provided in ProPG has been used to assess the proposed development site and recommend mitigation measures to reduce noise levels.

4.3 Noise egress

4.3.1 Standard guidance

BS 4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial sound* (BS 4142) provides a method for assessing noise from items such as building services plant against the existing background sound levels at the nearest noise sensitive premises.

BS 4142 suggests that if the noise level is 10 dB or more higher than the existing background sound level, it is likely to be an indication of a significant adverse impact. If the level is 5 dB above the existing background sound level, it is likely to be an indication of an adverse impact. If the level does not exceed the background sound level, it is an indication of having a low impact.

If the noise contains ‘attention catching features’ such as tones, bangs etc, a penalty, based on the type and impact of those features, is applied.

4.3.2 Local Authority criteria

Manchester City Council (MCC) provides guidance in relation to plant noise emissions in their *Planning and Noise Technical Guidance* document dated October 2022. The following criterion is stipulated:

'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 5 dB (L_{Aeq}) below the typical background (L_{A90}) level at the nearest noise sensitive location'

4.4 Noise ingress

4.4.1 Local Authority requirements

Based on the latest MCC *Planning and Noise Technical Guidance* (October 2022) it is understood that there are no specific internal noise criteria for hotel accommodation and that MCC indoor ambient noise levels criteria in the *Planning and Noise Technical Guidance* only apply for residential accommodation. For hotel developments, controlling noise ingress based on operator requirements is typically accepted.

4.4.2 British Standard guidance

Guidance on acceptable internal noise levels in residential dwellings is given in BS 8233:2014 *Sound insulation and noise reduction for buildings*. The guidance limits are shown in Table 1, for reference.

These internal levels are based on annual average data and do not have to be achieved in all circumstances. It is normal to exclude occasional events, such as fireworks night or New Year's Eve.

Table 1 Internal noise criteria for sleeping/resting

Internal space	Indoor ambient noise level, L_{Aeq} (dB)	
	Day (07:00 – 23:00)	Night (23:00 – 07:00)
Living rooms	35	-
Dining room	40	-
Bedrooms	35	30[1]

[1] BS 8233 notes that individual noise events can cause sleep disturbance, and that a guideline value may be set depending on the character and number of events per night, although no specific limit is provided. For regular events, such as scheduled aircraft or passing trains, a guideline value may be set in terms of SEL or $L_{Amax,F}$. Sporadic noise events could require separate values.

The standard states that where development is considered necessary or desirable, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved.

For external amenity areas, such as gardens and patios, the standard states:

> *'it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$ with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments. However, it is also recognized that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited.'*

4.4.3 ProPG

Internal noise ingress criteria in ProPG are the same as in BS 8233:2014 but additional guidance is provided. In relation to regular individual noise events the following additional guidance is provided:

> *'In most circumstances in noise sensitive rooms at night (e.g. bedrooms) good acoustic design can be used so that individual noise events do not normally exceed 45dB $L_{Amax,F}$ more than 10 times a night. However, where it is not reasonably practicable to achieve this guideline then the judgement of acceptability will depend not only on the maximum noise levels but also on factors such as the source, number, distribution, predictability and regularity of noise events*.'

4.4.4 Moxy Hotels standard criteria

Moxy Hotels give details of their acoustic criteria in document *MOXY EUROPE - ALL CHAPTERS FRANCHISED* dated June 2016.

The document states 'Short Term Noise: 50 dBA for short term (day/night) noise such as sirens and low level helicopter flights'. It has been assumed that this refers to maximum noise events measured using L_{AFmax} (dB). As maximum noise events are sporadic in nature, it is generally acceptable to remove measurements caused from irregular events. Internal noise level criteria are summarised in Table 2.

Table 2 Proposed internal noise limits

Internal space	Internal noise limit, L_{Aeq} (dB)	
	Daytime (07:00 – 23:00)	Night-time (23:00 – 07:00)
Bedroom internal noise limit, $L_{Aeq,1h}$ (dB)	45	40
Bedroom internal noise limit, L_{Amax} (dB)	50	50
Meeting spaces internal noise limit, L_{Aeq} (dB)	40	40

It has been assumed that the internal noise level due to maximum noise events is based on a representative maximum external noise event.

5 Survey method

5.1 Noise survey method

The survey included unattended and attended noise measurements.

5.1.1 Unattended measurements

Unattended noise monitoring was undertaken on the 3rd floor and 6th floor roofs at the site over 5 days. As shown in Figure 1.

The unattended measurements on the 3rd floor (Position A, facade measurement) were taken over 15-minute periods between 14:30 on 6 September 2024 and 13:15 on 10 September 2024.

The unattended measurements on the 6th floor (Position B, free-field measurement) were taken over 15-minute periods between 13:55 on 6 September 2024 and 12:55 on 10 September 2024.

Photographs showing the measurement locations are provided in Figure 2 and Figure 3, respectively. These locations were chosen to be reasonably representative of noise levels at the site.

Details of the equipment used and the noise indices measured are provided in Appendix A.

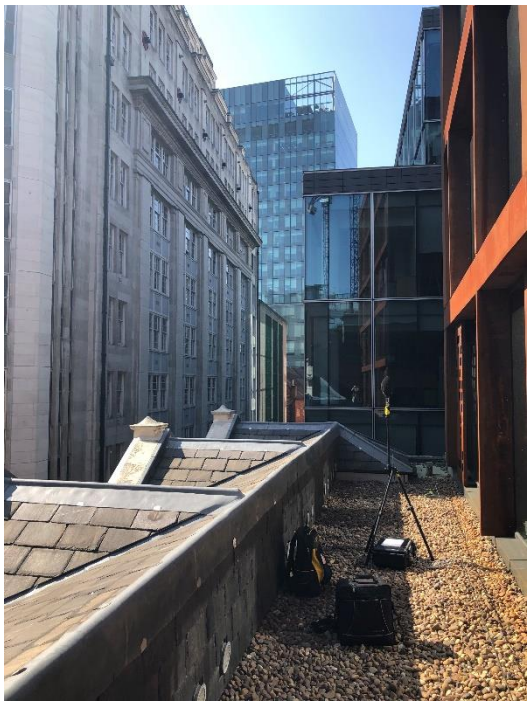


Figure 2 Unattended measurement position ‘A’ (facade measurement)

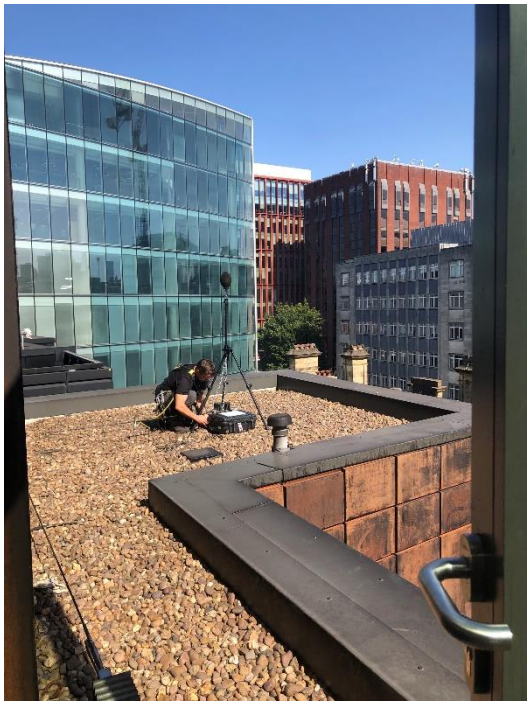


Figure 3 Unattended measurement position ‘B’ (free-field measurement)

5.1.2 Attended measurements

Attended sample measurements were taken at 3 locations around the site. These are indicated in Figure 1 as positions 1 to 3. The measurements were carried out on 6 September 2024. All measurements were 5 minutes in duration. All measurements were facade measurements.

Photographs showing the measurement locations 1 to 3 are provided in Figure 4 to Figure 6, respectively.



Figure 4 Attended measurement position 1 (facade measurement)



Figure 5 Attended measurement position 2 (facade measurement)



Figure 6 Attended measurement position 3 (facade measurement)

Details of the equipment used and the noise indices measured are provided in Appendix A.

5.2 Weather conditions

Weather conditions during the survey are described in Appendix A.

6 Measurement results

6.1 Observations

6.1.1 Noise

The dominant noise sources observed at position A during the survey was noted to be from road noise on Deansgate and Quay Street during vehicle passbys. Less significant noise sources included distant construction noise from the east and west and building services noise from 196 Deansgate to the south.

The dominant noise source observed at position B during the survey was noted to be from rooftop plant on 184-186 Deansgate. No other sources were discernible.

6.1.2 Unattended measurement results

A graph showing the results of the unattended measurements is provided in Appendix B.

Ambient noise levels measured at position A during the unattended survey are presented in Table 3. These are facade measurements.

Table 3 Ambient noise levels measured during the unattended survey – Position A (facade noise levels)

Date	Day (07:00 – 23:00) $L_{Aeq,16h}$ (dB)	Night (23:00 – 07:00) $L_{Aeq,8h}$ (dB)
Friday 6 September 2024	59[1]	61
Saturday 7 September 2024	61	61
Sunday 8 September 2024	57	58
Monday 9 September 2024	61	55
Tuesday 10 September 2024	62[2]	-
Average	60	59

[1] Measurement not made over full period due to monitoring start and end time (the measurement on 6 September 2024 was over 8.5 hours, between 14:30 and 23:00); not included in the average.

[2] Measurement not made over full period due to monitoring start and end time (the measurement on 10 September 2024 was over 6.25 hours, between 07:00 and 13:15); not included in the average.

Analysis of night-time maximum noise levels indicates that the night-time maximum noise level not normally exceeded 10 times a night is L_{AFmax} 83 dB at position A (facade noise level).

In line with BS 4142:2014+A1:2019, representative background sound levels have been determined using statistical analysis of the continuous measurements.

Day and night statistical analysis of representative values for the site are given in Figure 7 and Figure 8.

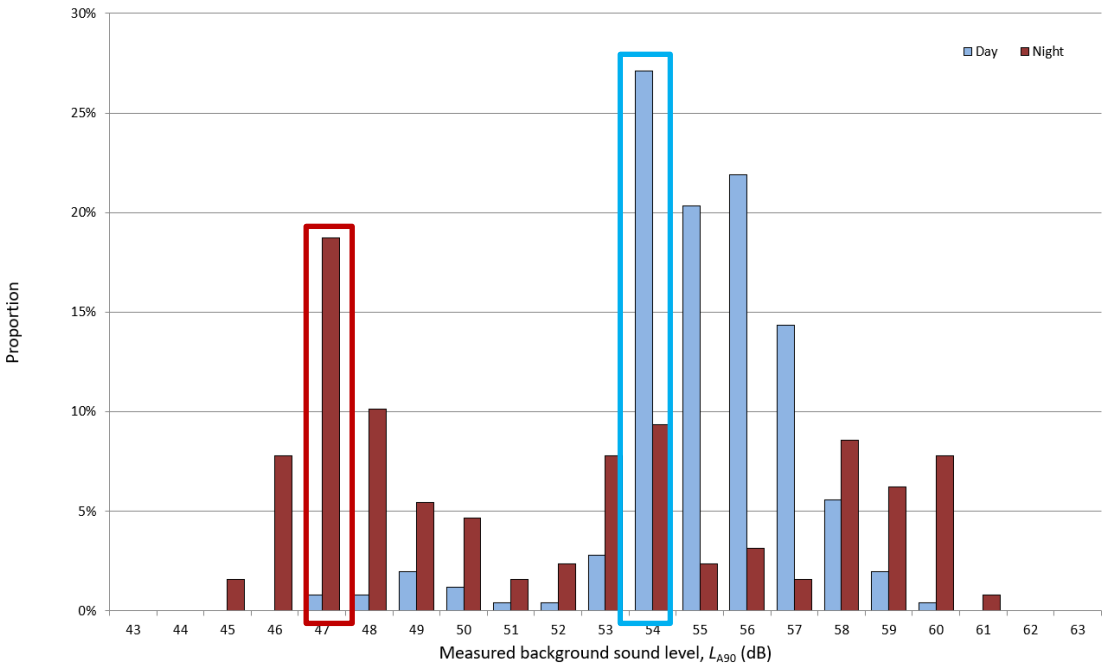


Figure 7 Position A Background noise levels histogram

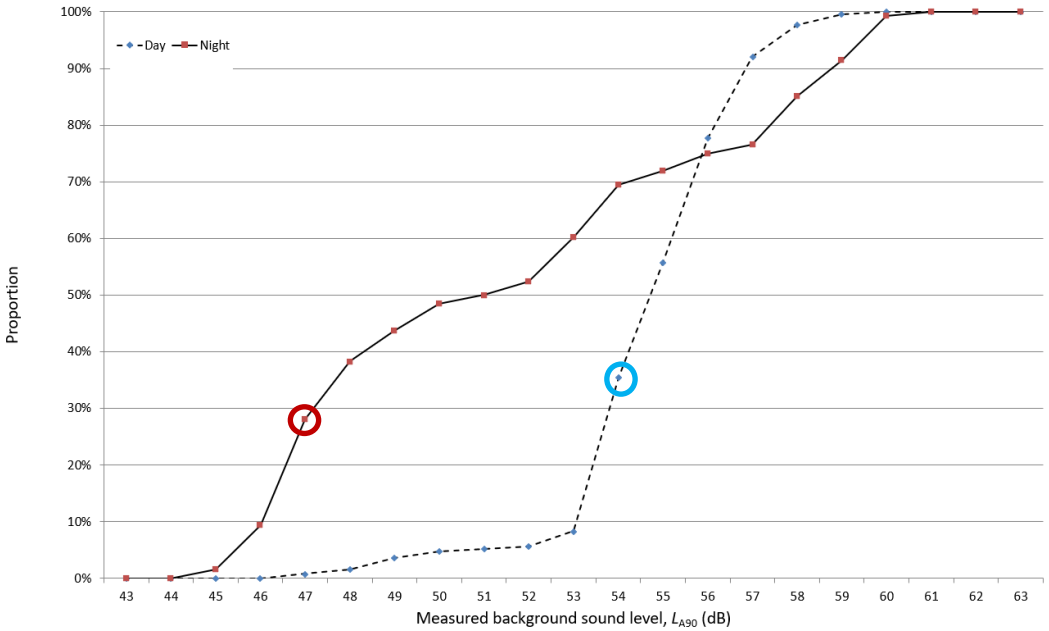


Figure 8 Position L Cumulative background noise levels

From this analysis, the representative background sound levels measured at position A during the survey were $L_{A90,15min}$ 54 dB during the day and $L_{A90,15min}$ 47 dB at night (facade noise levels).

Ambient noise levels measured at position B during the unattended survey are presented in Table 4. These are free-field measurements.

Table 4 Ambient noise levels measured during the unattended survey – Position B (free-field noise levels)

Date	Day (07:00 – 23:00) $L_{Aeq,16h}$ (dB)	Night (23:00 – 07:00) $L_{Aeq,8h}$ (dB)
Friday 6 September 2024	60[1]	60
Saturday 7 September 2024	60	61
Sunday 8 September 2024	57	55
Monday 9 September 2024	60	52
Tuesday 10 September 2024	59[2]	-
Average	59	57

[1] Measurement not made over full period due to monitoring start and end time (the measurement on 6 September 2024 was over 9 hours, between 13:55 and 23:00); not included in the average.

[2] Measurement not made over full period due to monitoring start and end time (the measurement on 10 September 2024 was over 6 hours, between 07:00 and 12:55); not included in the average

Analysis of night-time maximum noise levels indicates that the night-time maximum noise level not normally exceeded 10 times a night is L_{AFmax} 80 dB at position B (free-field noise level).

In line with BS 4142:2014+A1:2019, representative background sound levels have been determined using statistical analysis of the continuous measurements.

Day and night statistical analysis of representative values for the site are given in Figure 9 and Figure 10.

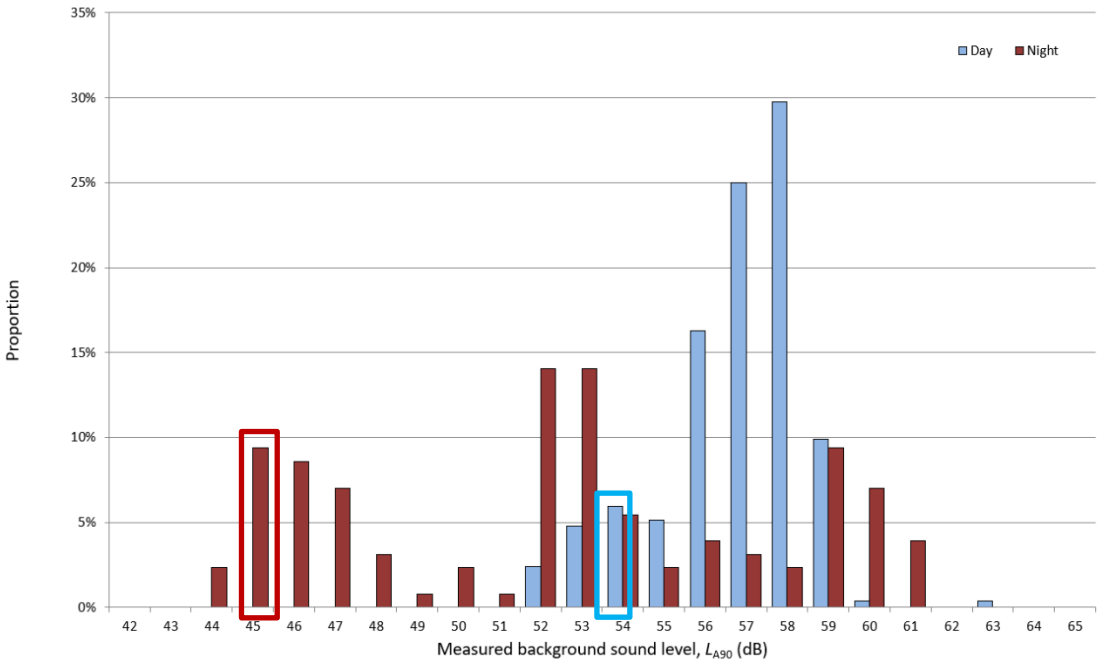


Figure 9 Position B Background noise levels histogram

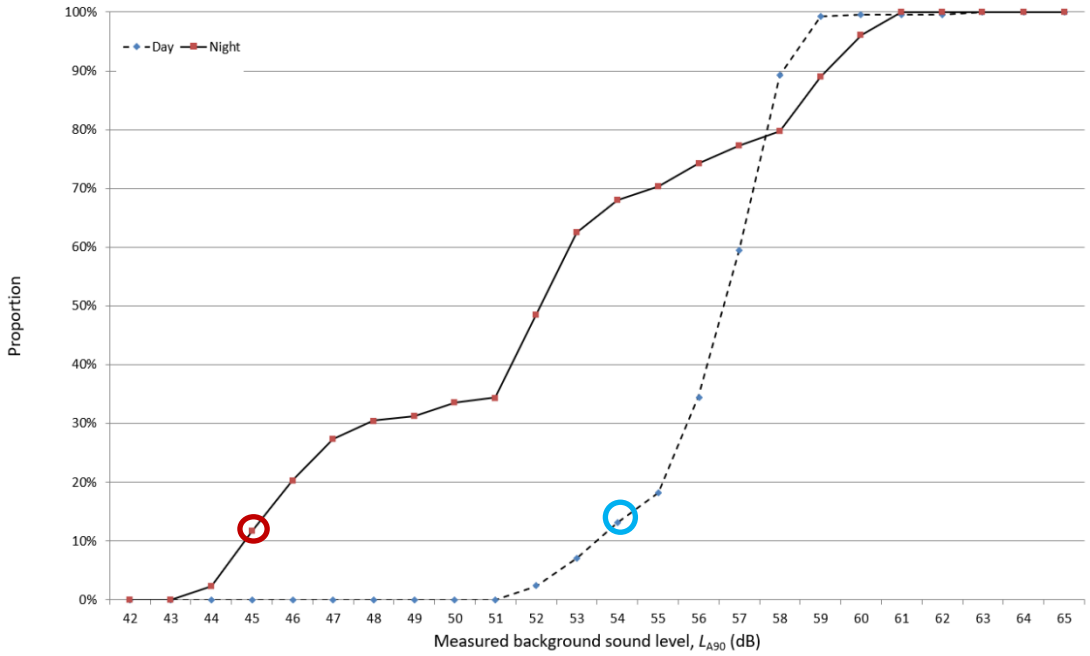


Figure 10 Position B Cumulative background noise levels

From this analysis, the representative background sound levels measured at position B during the survey were $L_{A90,15min}$ 54 dB during the day and $L_{A90,15min}$ 45 dB at night (free-field noise levels).

The corresponding facade noise levels are $L_{A90,15min}$ 57 dB during the day and $L_{A90,15min}$ 48 dB at night (these have been corrected relative to the measured free-field background sound levels by the addition of 3 dB as per the guidance provided in BS 8233:2014 Section G.2.1).

6.1.3 Attended measurement results

Noise levels and key sources recorded during the attended measurements are summarised in Table 5.

Table 5 Noise levels and key noise sources from attended measurements

Position	Start time	Sound pressure levels (dB)			Noise sources
		$L_{Aeq,5min}$	$L_{AFmax,5min}$	$L_{A90,5min}$	
1	15:25	60	87[1]	57	Road noise from Atkinson St, Deansgate. and Quay St dominant. Plant from 192 Deansgate audible.
1	15:30	62	85[1]	58	Road noise from Atkinson St, Deansgate. and Quay St dominant. Plant from 192 Deansgate audible.
1	15:35	61	82[1]	57	Road noise from Atkinson St, Deansgate. and Quay St dominant. Plant from 192 Deansgate audible.
1	16:25	62	80[1]	59	Road noise from Atkinson St, Deansgate. and Quay St dominant. Plant from 192 Deansgate audible.
1	16:30	61	78[1]	58	Road noise from Atkinson St, Deansgate. and Quay St dominant. Plant from 192 Deansgate audible.
1	16:35	62	84[1]	58	Road noise from Atkinson St, Deansgate. and Quay St dominant. Plant from 192 Deansgate audible.
2	15:05	62	76	57	Vehicle passbys dominant. Distant construction works.

Position	Start time	Sound pressure levels (dB)			Noise sources
		$L_{Aeq,5min}$	$L_{AFmax,5min}$	$L_{A90,5min}$	
2	15:10	66	77	58	Vehicle passbys dominant. Distant construction works.
2	15:15	63	73	58	Vehicle passbys dominant. Distant construction works.
2	16:05	65	79	61	Vehicle passbys dominant. Distant construction works.
2	16:10	67	79	62	Vehicle passbys dominant. Distant construction works.
2	16:15	63	72	60	Vehicle passbys dominant. Distant construction works.
3	14:45	59	73	55	Distant roadnoise from Deansgate dominant.
3	14:50	59	71	56	Distant roadnoise from Deansgate dominant.
3	14:55	60	74	55	Distant roadnoise from Deansgate dominant.
3	15:45	60	73	55	Distant roadnoise from Deansgate dominant.
3	15:50	59	76	55	Distant roadnoise from Deansgate dominant.
3	16:00	60	71	57	Distant roadnoise from Deansgate dominant.

[1] High L_{AFmax} noise levels due to car passes turning from Little Quay St to Atkinson St, approx. 3 meters from the measurement position.

7 Plant noise egress

7.1 Limits

Based on the representative background noise levels of L_{A90} 54 dB for day, and L_{A90} 47 dB for night at position A (these are lower than position B and therefore worst-case), the cumulative noise level from the operation of all new plant should not exceed the limits set out in Table 6.

The limits apply at 1 m from the worst affected windows of the nearest noise sensitive premises and are presented as facade levels. In this case these limits would apply at noise sensitive receptors identified in Section 2.2.

Table 6 Plant noise limits at 1 m from the nearest noise sensitive premises

Time of day	Maximum sound pressure level at 1 m from noise sensitive premises, $L_{Aeq,15min}$ (dB)
Day (07:00-23:00)	49
Night (23:00-07:00)	42

[1] The limits set out in Table 6 do not include any attention catching features. The penalty corrections for attention catching features may be significant, and will need to be considered as the building services design progresses. This is discussed in Appendix C.

7.2 Assessment

All building services plant will be designed to achieve the noise limits set out above, including any corrections for attention catching features. At this stage, no information is available in relation to the proposed plant. This will need to be assessed as the design progresses.

8 Facade sound insulation – noise ingress

This section describes an assessment of facade sound insulation to control noise ingress. The required facade specification largely depends on the external noise levels and the internal noise criteria.

The following assessment is based on achieving the internal noise levels as per the Moxy Hotels standard criteria, as detailed in Section 4.4.4.

8.1 External noise levels

Predicted external noise levels at the facades of the proposed development have been grouped into zones, as shown in Figure 11.

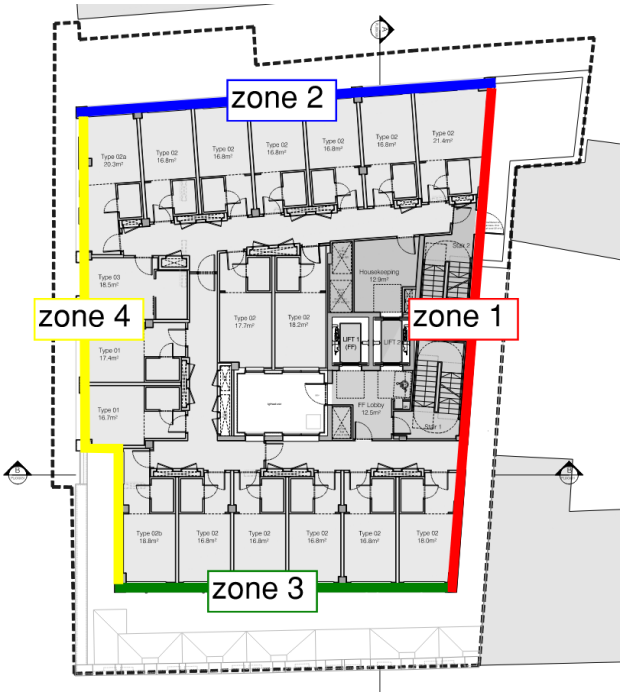


Figure 11 Proposed facade zones

Table 7 provides predicted external noise levels for each facade zone, along with predicted maximum night-time noise levels (L_{AFmax}).

Maximum noise levels during the day have not been assessed since the measurements obtained are affected by nearby construction noise during the day. This is not considered representative of typical conditions. Since the day and night ambient noise levels (L_{Aeq}) are similar, it is expected that the maximum noise levels measured at night are also representative of typical conditions during the day.

Table 7 External noise level at proposed facade zones

Facade zones	Predicted external noise level, $L_{Aeq,1h}$ (dB)		Predicted maximum night-time noise level, L_{AFmax} (dB)
	Day	Night	
	07:00-23:00	23:00-7:00	23:00-7:00
Zone 1	66-67	66-67	80-81
Zone 2	64-65	64-65	78-79
Zone 3	64-65	62-63	78-79
Zone 4	≤62	≤61	≤76

8.2 Facade sound insulation

Minimum facade sound insulation requirements for the facades under the background ventilation condition are given in Table 8. These have been determined to achieve the internal noise criteria using predicted external noise levels at the facades.

At this site, the facade performance requirements are driven by the maximum noise levels during the night. The facade specification has been determined to ensure that $L_{AFmax\ 2\ min}$ criteria is exceeded on no more than 10 occasions based on the worst affected night during the survey.

Table 8 Facade sound insulation performance requirements

Facade	Overall sound insulation performance, R'_w+C_{tr} (dB)
Zone 1	29
Zone 2	28[1]
Zone 3	28[1]
Zone 4	28[1]

[1] Facade sound insulation has been capped at a minimum requirement of R'_w+C_{tr} 28 dB, typically achievable with standard thermal double glazing (6 mm glass/16 mm cavity/6 mm glass) and a mechanical ventilation strategy.

8.3 Guidance on facade construction, glazing, and ventilation strategy

The performance required by each element will depend on the relative areas of glazed and non-glazed elements, and the ventilation strategy. As a guide, for a mechanically ventilated room with a 50% glazed facade, the glazing sound insulation requirement would typically be

3 dB lower than the overall facade sound insulation requirement. This is provided the non-glazed external wall elements provide at least 10 dB more sound insulation than the glazed elements.

Standard thermal double glazing (ie, 6 mm glass/16 mm cavity/6 mm glass) is expected to be suitable throughout, based on a mechanical ventilation strategy, up to 80% glazed areas to rooms and non-glazed external wall elements providing at least R'_w+C_{tr} 38 dB.

9 Conclusion

Representative background sound levels measured during the survey were $L_{A90,15min}$ 54-57 dB during the day and $L_{A90,15min}$ 47-48 dB at night.

Based on the requirements of the Manchester City Council and on the results of the noise survey, all plant must be designed such that the cumulative noise level at 1 m from the worst affected windows of the nearby noise sensitive premises does not exceed $L_{Aeq,15min}$ 49 dB during the day and $L_{Aeq,15min}$ 42 dB during the night.

All building services plant will be designed to achieve the noise limits set out above, including any corrections for attention catching features. At this stage, no information is available in relation to the proposed plant. This will need to be assessed as the design progresses.

The average ambient noise levels measured during the survey were $L_{Aeq,16h}$ 60-62 dB during the day and $L_{Aeq,8h}$ 59-60 dB at night.

Analysis of night-time maximum noise levels indicates that the night-time maximum noise level not normally exceeded 10 times a night is L_{AFmax} 83 dB.

An initial assessment has been carried out to determine required acoustic performances for the facades and provide guidance on the ventilation strategy. Standard thermal double glazing with mechanical ventilation is expected to be suitable to control environmental noise ingress to meet the Moxy hotel standards throughout.

Appendix A

Survey details

Equipment

The unattended and attended noise measurements were taken using a Rion NL-52 sound level meter and a B&K 2250 sound level meter, respectively.

Calibration details for the equipment used during the survey are provided in Table A1.

Table A1 Equipment calibration data

Equipment description	Type/serial number	Manufacturer	Calibration expiry	Calibration certification number
Position A				
Sound level meter	NL-52/01010788	Rion	20 Sep 25	TCRT23/1666
Microphone	UC-59/20416	Rion	20 Sep 25	TCRT23/1666
Pre-amp	NH-25/11436	Rion	20 Sep 25	TCRT23/1666
Calibrator	SV30A/10559	Svantek	20 Sep 25	TCRT23/1665
Position B				
Sound level meter	NL-52/01143564	Rion	15 Dec 24	TCRT22/1766
Microphone	UC-59/10153	Rion	15 Dec 24	TCRT22/1766
Pre-amp	NH-25/43581	Rion	15 Dec 24	TCRT22/1766
Calibrator	NC-74/34257023	Rion	15 Dec 24	TCRT22/1765
Attended Measurements				
Sound level meter	2250/3011964	Brüel & Kjær	11 Sep 25	UCRT23/2163 UCRT23/2167
Microphone	4189/3100176	Brüel & Kjær	11 Sep 25	UCRT23/2163 UCRT23/2167
Pre-amp	ZC0032/26376	Brüel & Kjær	11 Sep 25	UCRT23/2163 UCRT23/2167
Calibrator	4231/3019123	Brüel & Kjær	11 Sep 25	UCRT23/2162

Calibration of the meters used for the measurements is traceable to national standards. Calibration certificates for the sound level meters used in this survey are available upon request.

Calibration checks were carried out on the meters and their measurement chains at the beginning and end of the survey. No significant calibration deviation occurred.

Noise indices

Noise indices recorded included the following:

- $L_{Aeq,T}$ The A-weighted equivalent continuous sound pressure level over a period of time, T.
- $L_{AFmax,T}$ The A-weighted maximum sound pressure level that occurred during a given period, T, with a fast time weighting.
- $L_{A90,T}$ The A-weighted sound pressure level exceeded for 90% of the measurement period. Indicative of the background sound level.

Sound pressure level measurements are normally taken with an A-weighting (denoted by a subscript 'A', eg L_{A90}) to approximate the frequency response of the human ear.

A more detailed explanation of these quantities can be found in BS 7445: Part 1: 2003 *Description and measurement of environmental noise, Part 1. Guide to quantities and procedures.*

Weather conditions

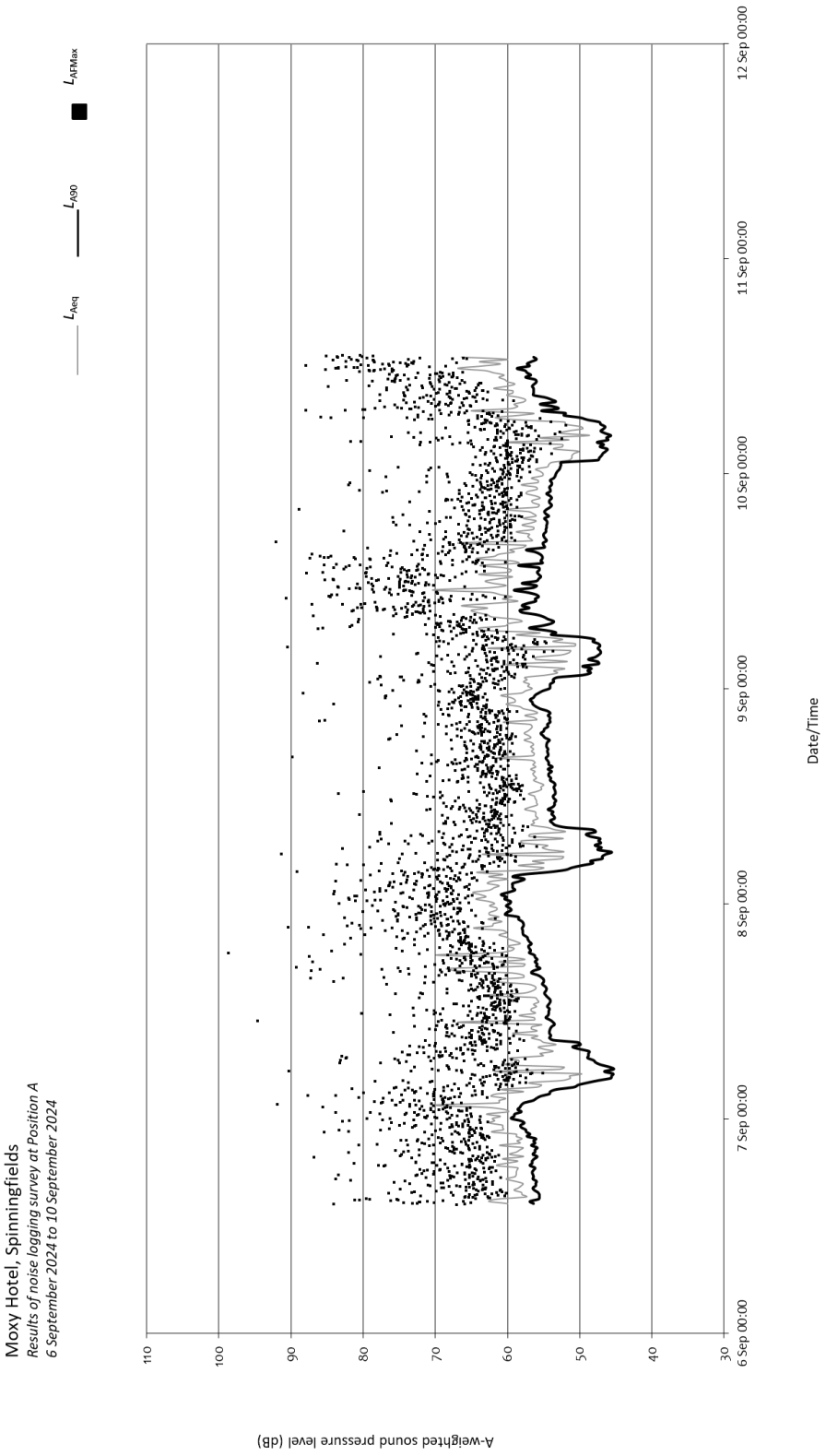
During the unattended noise measurements, weather reports for the area indicated that temperatures varied between 11°C at night and 25°C during the day. The wind speed reached up to 8 m/s, however a review of the survey time data revealed no discernible increase to measured sound pressure levels.

During the attended noise measurements, weather reports for the area indicated that temperatures varied between 24°C and 25°C throughout the measurement period. The wind speed reached up to 6 m/s, however a review of the survey time data revealed no discernible increase to measured sound pressure levels.

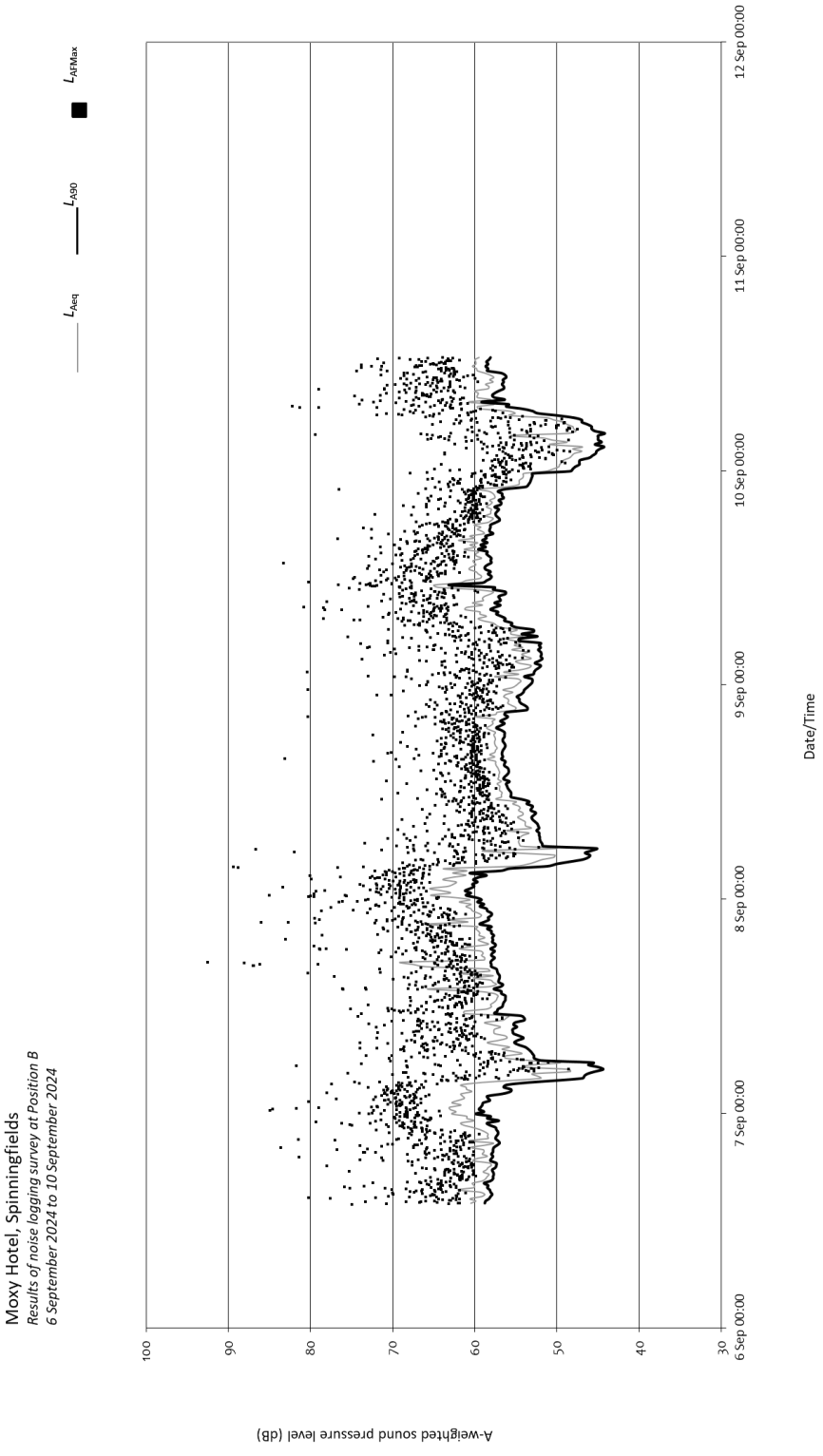
These weather conditions are considered suitable for obtaining representative measurements.

Appendix B

Results of unattended measurements at Position A


Moxy Hotel, Spinningfields
Results of noise logging survey at Position A
6 September 2024 to 10 September 2024
L_{Aeq}
L_{A90}
L_{AFMax}
A-weighted sound pressure level (dB)
110
100
90
80
70
60
50
40
30
6 Sep 00:00
7 Sep 00:00
8 Sep 00:00
9 Sep 00:00
10 Sep 00:00
11 Sep 00:00
12 Sep 00:00
Date/Time

Results of unattended measurements at Position B


Moxy Hotel, Spinningfields
Results of noise logging survey at Position B
6 September 2024 to 10 September 2024
L_{Aeq}
L_{A90}
L_{AFMax}
A-weighted sound pressure level (dB)
100
90
80
70
60
50
40
30
6 Sep 00:00
7 Sep 00:00
8 Sep 00:00
9 Sep 00:00
10 Sep 00:00
11 Sep 00:00
12 Sep 00:00
Date/Time

Appendix C

BS 4142 corrections for attention catching features

The following applies where plant noise is assessed in accordance with BS 4142:2014+A1:2019.

If the proposed plant noise contains attention catching features (such as tonal elements, whines, whistles, bangs etc), penalty corrections should be applied based on the type and impact of the features.

If appropriate, a subjective assessment of the plant features can be adopted. Where the plant noise contains tonal elements, the following corrections can be made depending on how perceptible the tone is at the noise receptor:

- 0 dB where the tone is not perceptible
- 2 dB where the tone is just perceptible
- 4 dB where the tone is clearly perceptible
- 6 dB where the tone is highly perceptible.

Where the plant noise is impulsive, the following corrections can be made depending on how perceptible the impulsivity is at the noise receptor:

- 0 dB where the impulse is not perceptible
- 3 dB where the impulse is just perceptible
- 6 dB where the impulse is clearly perceptible
- 9 dB where the impulse is highly perceptible.

For noise which is equally both impulsive and tonal, then both features can be accounted for by linearly summing the corrections for both characteristics.

If the plant has other distinctive characteristics, such as intermittency, then a 3 dB correction can be made.

If a subjective assessment of tonality is not appropriate, an objective assessment can be made by analysis of time-averaged, third-octave band sound pressure levels. A noise source is deemed to be tonal if the level in a third-octave band exceeds the level in adjacent third-octave bands by the level differences given below:

- 15 dB in the low frequency third-octave bands (25 Hz to 125 Hz)
- 8 dB in the mid frequency third-octave bands (160 Hz to 400 Hz)
- 5 dB in the high frequency third-octave bands (500 Hz to 10000 Hz).

If an objective assessment identifies the plant noise to be tonal then a 6 dB correction must be made.