



NOISE ASSESSMENT

on behalf of

THE ARCH COMPANY PROPERTIES LIMITED

for the site at

CORPORATION STREET, MANCHESTER

REPORT DATE: 7 AUGUST 2025

REPORT NUMBER: NA102959-2

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Summary

A noise impact assessment has been undertaken to predict the potential impact of a proposed redevelopment of arch unit 5 at Corporation Street, Manchester. This was requested by The Arch Company Properties Limited to support a planning application for the site.

A planning application for the redevelopment of ten arches adjacent to Unit 5 (arches 2 – 4 and 6 – 11) has already been granted planning permission. Miller Goodall Ltd undertook a noise impact assessment for that application in report ref NA 102959_V3 dated 17th May 2023. The report concluded that, provided the mitigation measures recommended in said report are adhered to, the use of the ten arches as busy bars/pubs would not have an adverse noise impact. However, if used as nightclubs, additional sound insulation would be required.

Background sound level monitoring was undertaken for the noise impact assessment for the ten approved arch units in January 2023. The results of this monitoring have been used in this noise impact assessment for Unit 5.

A noise model has been assembled for the proposed development, the results from which are provided within this report.

It has been found that busy/pub bar operations will result in a low noise impact at the nearest noise sensitive receptors, cumulatively with the approved arches; however, nightclub use would require enhanced sound insulation to the unit frontage.

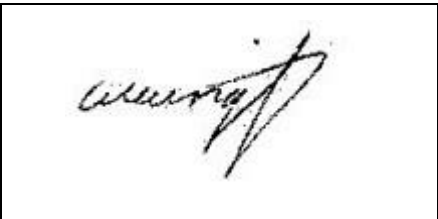
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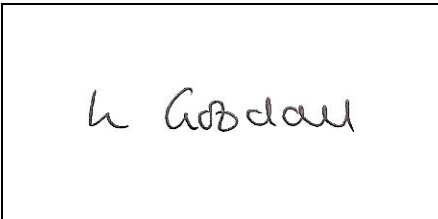
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Advisory Note

It is recommended that you confirm the suitability of all recommended noise mitigation measures with your architects, structural engineers, building contractors, fire consultants and material manufacturers prior to procurement and field application so that when the recommended noise control measures are implemented on site they will satisfy the requirements of all disciplines, therefore, should not cause any health and safety issues.

1 Introduction

- 1.1 Miller Goodall Ltd has on behalf of The Arch Company Properties Limited, prepared this addendum noise assessment to consider the potential noise impact arising from the proposed inclusion of Arch Unit 5 within the arches development at Corporation Street, Manchester. The site lies beneath the railway viaduct immediately east of Manchester Victoria station.
- 1.2 This assessment examines the potential noise impact of operations associated with Unit 5 during worst-case periods with respect to noise, addressing breakout of internal entertainment noise, and the cumulative effect when Unit 5 is assessed alongside the already approved Units 2 – 4 and 6 – 11.
- 1.3 All methodology, baseline data, receptor positions, criteria and mitigation measures remain as set out in the approved report (ref. 102959_V3, May 2023) unless specifically noted otherwise within this addendum.

2 Site Description

- 2.1 The site comprises a single railway arch (unit 5) beneath the railway line along Corporation Street, Manchester. The unit sits between the arch units previously assessed in the report ref. 102959_V3, May 2023.
- 2.2 The surrounding area is a mixture of residential apartments and car parking to the south of the railway line. The high-rise residential apartments on the southern side of the railway line are located on the corner of Corporation Street and Mincing Street. There is also residential accommodation directly opposite the site on Corporation Street, namely Ashton House and Manchester Court, off Crown Lane.
- 2.3 The nearest noise-sensitive receptors (NSRs) to the proposed development remain the same for the assessment of Unit 5 as for the approved units 2 – 4 and 6 –11, these are identified in **Figure 1** below.

Figure 1: Nearest identified NSRs to the proposed arches development (first-floor level – 4m height)



- 2.4 NSR A is a first-floor window (4m height) at Ashton House. NSR B is a first-floor residential window at 87 Dantizic Street (Manchester Court). NSR C is the residential development on the corner of Mincing Street, Little Nelson Street and Corporation Street (The Stile – Meadowside).

3 Proposed Development

- 3.1 The development is for a scheme to enhance arch unit 5 at Corporation Street for retail/food and beverage use. The proposal will follow the approved redevelopment of Arches 2 – 4 and 6 – 11 is to create a run of arches with a mixture of metal, glazing and louvring for letting to public-facing businesses such as restaurants, supermarkets, bars, competitive socialising operators, leisure operators, small studio gyms etc. The application is proposed as Sui Generis.
- 3.2 The site is below the existing railway line, which has noise sources from passenger and haulage trains on the line. The diesel haulage will operate through the night-time period and are likely to be loud to those properties closest to the railway line.

3.3 No fixed end users have been identified for the development to date, the assessment has therefore been based on a worst-case assessment of bar/restaurant uses.

4 Policy, Guidance and Assessment Methodology

4.1 National planning policy is outlined in **Appendix 1: Planning Policy**. The acoustic standards and assessment techniques referred to in this assessment are outlined in **Appendix 2: Acoustic Standards and Guidance**.

5 Local Authority Consultation

5.1 MCC was consulted in respect of the methodology used in the original assessment assessment¹. No response was received directly regarding the consultation, however, as the application has been approved based on the submitted noise report (ref. 102959_V3, May 2023), the same methodology has been used for this assessment.

6 Noise Survey and Assessment Criteria

6.1 Summary Overview of January 2023 Survey Results

6.1.1 The lowest measured $L_{A90(5min)}$ was 43dB at MP1. Representative background sound levels in each octave band at this location have been ascertained from the monitoring data. **Table 1** below provides the octave band data for the lowest 5-minute measurement during the survey (at position MP1). This period is not impacted by the extraneous alarms which were audible at the site.

Table 1: Representative L_{A90} Octave Band Background Sound Data

Position	63 Hz	125 Hz	250 Hz	500 Hz	1.0 kHz	2.0 kHz	4.0 kHz	8.0 kHz	L_{A90}
1	53.2	51.0	45.0	39.3	36.2	30.5	21.0	12.2	44.1

¹ Email to contact@manchester.gov.uk on 11th January 2023 with a proposed methodology and follow up email on 20th February 2023 to planning@manchester.gov.uk.

6.2 Assessment Criteria

6.2.1 The results from the above table have been utilised to provide an assessment criterion for the nearest noise sensitive receptors in line with the MCC guidelines.

Table 2: L_{90} Converted Spectrum and MCC Assessment Criteria

Description	Level, dB, at Octave Band Centre Frequency (Hz)							
	63	125	250	500	1000	2000	4000	8000
L_{90} NSR A	53	51	45	39	36	30	21	12
L_{eq} criteria for entertainment noise	≤ 43	≤ 41	≤ 35	≤ 29	≤ 26	≤ 20	≤ 11	≤ 2

6.2.2 In order to ensure that unit 5 operations have a low noise impact on the NSRs cumulatively with the approved arches 2 – 4 and 6 – 11, the assessment shall consider cumulative noise from the operation of all ten arches for a worst-case.

7 Impact of Noise from the Proposed Development

7.1 Noise Modelling

7.1.1 Predicted noise levels at sensitive receptors was carried out using CadnaA software package. The data from measurements taken was used to populate an environmental noise model.

7.1.2 The general horizontal plan information of the area surrounding and including the proposed development site was imported from Google Earth. This was used to determine road positions, building footprint areas and relative locations and is considered accurate to within 5 %. Building height information was based on site observations. Topography was not included in the design of the model as the proposed site is flat with little variation in terrain height. Sound reduction indices for the building envelope came from the Building Bulletin 93 materials database, or from Insul sound insulation prediction software.

7.1.3 The following parameters were assigned to the model:

- Propagation of noise using algorithms within ISO 9613-2:2024 *Acoustics – Attenuation of sound during propagation outdoors*.
- Default ground absorption $G = 0.21$ (representative of mostly reflective ground such as tarmac and pavement)
- Ground attenuation: spectral all sources
- No adverse meteorological effects
- Two orders of reflection

7.1.4 The construction and assumed sound reduction indices of the elements making up the building envelope are shown in **Table 3**.

Table 3: Assumed sound reduction indices (SRI) of building façade elements

Façade element	Sound Reduction Index (SRI), dB								R_w
	in Octave Band Centre Frequency, Hz								
	63	125	250	500	1k	2k	4k	8k	
External walls (min. 140 mm brick)	38	42	43	38	46	54	61	61	46
Glazing (SG Stadip Silence 8.4:12:10.8 mm)	22	28	29	39	44	50	61	64	42

7.1.5 The octave band L_{eq} source data shown in **Table 4** were imported directly into the model. This data was obtained from the Little Red Book of Acoustics (2013).

Table 4: Noise source data used within CadnaA

Description	Internal Reverberant Sound Pressure Level, dB in Octave Band Centre Frequency, Hz								dB(A)
	63	125	250	500	1k	2k	4k	8k	
Busy Pub/Bar	80	85	85	85	85	80	70	70	88
Music Bar/Nightclub	110	110	100	100	95	90	85	85	101

7.2 **Assessment to MCC Entertainment Noise Criteria**

7.2.1 The predicted noise levels resulting from noise generated within the proposed units (1 – 11) during busy operating periods are shown graphically in Figures 1 and 2 below. The predicted noise levels

are based on the internal noise levels assumed in Table 4 and the façade insulation performance assumed in **Table 3**.

Figure 1: Predicted break-out noise levels from the Busy Pub/Bar

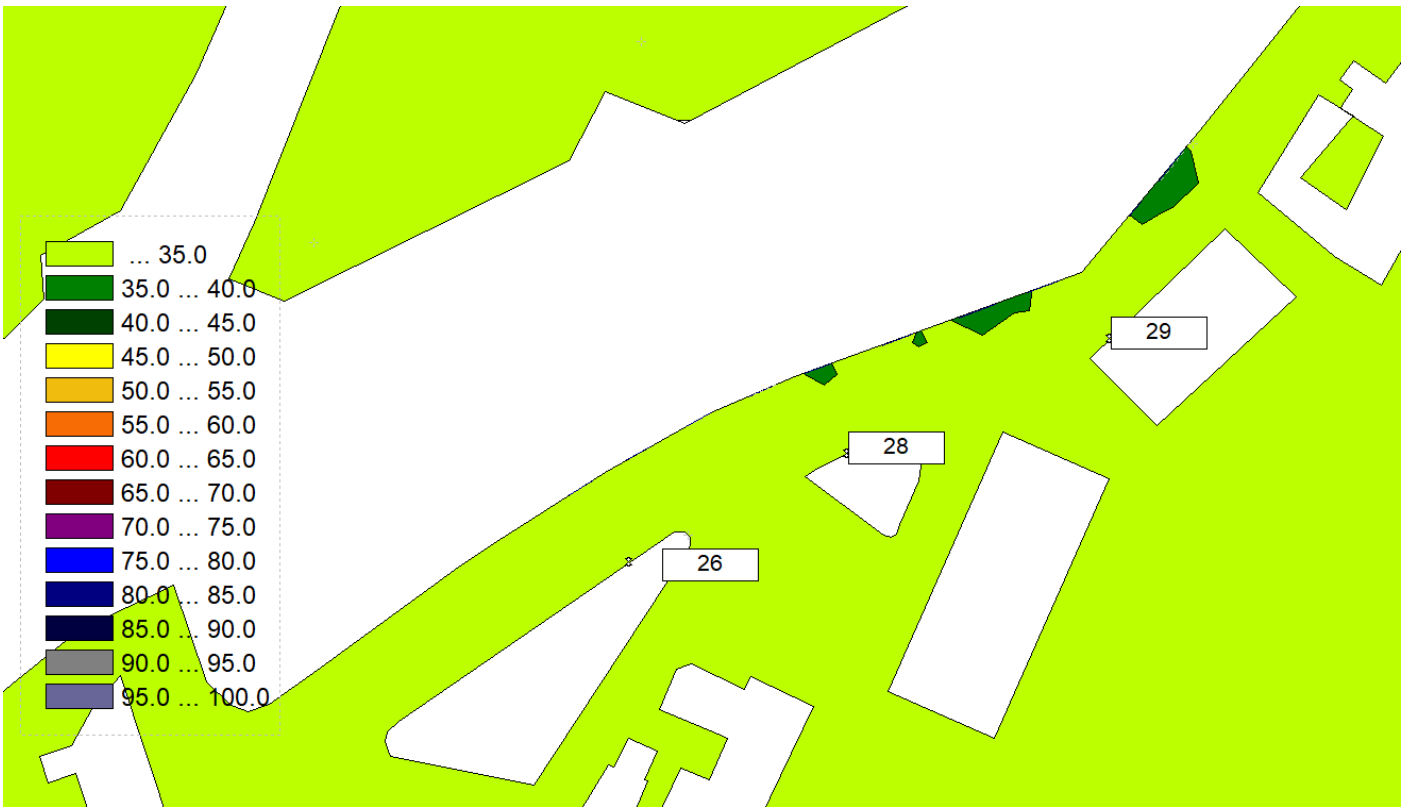


Figure 2: Predicted break-out noise levels from the Music Bar/Nightclub

7.2.2 The predicted octave band L_{eq} levels at the receptors are shown in **Table 5** and **Table 6** and demonstrate the comparison with the MCC criteria.

Table 5: Predicted Octave-band Noise Levels at NSR A and Comparison to Background L_{90} – Busy Pub/Bar

Description	Sound Pressure Level, dB in Octave Band Centre Frequency, Hz								dB(A)
	63	125	250	500	1k	2k	4k	8k	
Representative LA90 Octave Band Background Sound Data	53.2	51.0	45.0	39.3	36.2	30.5	21.0	12.2	44.1
Leq criteria; entertainment noise	≤ 43	≤ 41	≤ 35	≤ 29	≤ 26	≤ 21	≤ 11	≤ 2	-
NSR A L_{eq} noise level	35	33	32	22	17	6	-15	-20	-
Diff.	-8	-8	-3	-7	-9	-15	-26	-22	-
NSR B L_{eq} noise level	37	35	34	24	19	8	-13	-18	-
Diff.	-6	-6	-1	-5	-7	-13	-24	-20	-
NSR C L_{eq} noise level	38	36	35	25	20	9	-13	-17	-
Diff.	-5	-5	-1	-4	-6	-12	-24	-19	-

Table 6: Predicted Octave-band Noise Levels at NSR A and Comparison to Background L_{90} – Nightclub

Description	Sound Pressure Level, dB in Octave Band Centre Frequency, Hz								dB(A)
	63	125	250	500	1k	2k	4k	8k	
Representative LA90 Octave Band Background Sound Data	53.2	51.0	45.0	39.3	36.2	30.5	21.0	12.2	44.1
Leq criteria; entertainment noise	≤ 43	≤ 41	≤ 35	≤ 29	≤ 26	≤ 21	≤ 11	≤ 2	-
NSR A L_{eq} noise level	65	58	47	37	27	16	0	-5	
Diff.	22	17	12	8	1	-5	-11	-7	
NSR B L_{eq} noise level	67	60	49	39	29	18	2	-3	
Diff.	24	19	14	10	3	-3	-9	-5	
NSR C L_{eq} noise level	68	61	50	40	30	19	2	-2	
Diff.	25	20	15	11	4	-2	-9	-4	

- 7.2.3 The predicted noise levels achieve the MCC criteria at each octave band for the Busy Bar/Pub.
- 7.2.4 The scenario with 10 nightclubs unsurprisingly exceeds the criteria at the majority of octave bands. All proposals use the mitigation proposed at that specified in **Table 3**, which includes high performance acoustic laminated glazing.
- 7.2.5 The results indicate that noise criteria at the receptors can be achieved assuming 'busy pub/ bar' noise levels; however, they are likely to be exceeded if 'music bar/ nightclub' noise levels are assumed. It may be necessary, therefore, to limit the levels of internal noise in these units by use of a suitably worded planning condition to ensure that should the use of unit 5 as a night club be required, additional sound insulation measures are applied to unit 5, which may include, but are not limited to:
- Inclusion of additional sound insulation within the development to provide a fully lobbied entrance to the nightclub
 - Management controls of noise levels internally.
- 7.2.6 The prediction modelling assumes a fully sealed façade, and in practice this will not be the case with the presence of glazed doors, which would significantly reduce the performance of the façade.

We would therefore recommend that any units which are proposed to be used for entertainment purposes should use lobbied doors, each with a minimum acoustic rating of R_w 30 dB, which include an automatic closing mechanism and or are actively managed by door staff to ensure these remain closed when not in use.

- 7.2.7 No data has been provided at this stage of the development to include for plant related to extraction or air conditioning plant at the site. A suitably worded condition could be applied to the planning condition to ensure the rating level from plant does not exceed the existing background sound levels at the site.
- 7.2.8 It should be noted that the location of the site is below an existing active railway line which operates through the day with passenger trains and diesel haulage trains and through the night with diesel haulage trains, which will be loud for those properties close to the railway line.
- 7.2.9 It should also be noted that this application for the redevelopment of Unit 5 allows for the same potential uses as the approved arches 2 – 4 and 6 – 11, and is therefore, as a proportion of cumulative sound levels incident on the NSRs, effectively negligible.

8 Conclusions

- 8.1 The original baseline survey and octave-band entertainment-noise criterion adopted for Arches 2 – 4 & 6 – 11 remain applicable to this addendum. Those criteria have therefore been used to evaluate the inclusion of Arch Unit 5 at Corporation Street, Manchester.
- 8.2 Noise-breakout modelling for Unit 5, cumulatively with the approved units 2 – 4 and 6 – 11, based on a busy pub/bar use, demonstrates compliance with the MCC criterion at every octave band provided the façade elements match or exceed the sound-reduction performance set out in **Table 3** of this addendum.
- 8.3 As previously reported, a scenario in which all arches, including Unit 5, operate as music pubs/bars or night-clubs would exceed the MCC criterion. This represents a highly conservative worst-case. Should a louder, amplified music-led use be proposed for any unit, a planning condition is still recommended that requires the occupier to:
- establish an internal noise rating level agreed with MCC; and

- implement additional sound-insulation measures (for example, upgraded glazing, fully lobbied entrances and/or enhanced management controls) to demonstrate that the agreed rating level can be met at the receptors.

8.4 Subject to the installation of façade elements delivering the sound-insulation performance in **Table 3**, the redevelopment of Unit 5 is not predicted to result in a significant noise impact for typical busy pub/bar uses. The conclusions and recommendations of the approved report (ref. 102959_V3) therefore remain valid, and noise should not form a material constraint to the approval of the application to redevelop Unit 5.

APPENDICES

Appendix 1: Planning Policy

Noise Policy Statement for England

The Noise Policy Statement for England (NPSE²), published in March 2010, sets out the long-term vision of Government noise policy. The Noise Policy aims, as presented in this document, are:

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

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

The NPSE makes reference to the concepts of NOEL (No Observed Effect Level) and LOAEL (Lowest Observed Adverse Effect Level) as used in toxicology but applied to noise impacts. It also introduces the concept of SOAEL (Significant Observed Adverse Effect Level) which is described as the level above which significant adverse effects on health and the quality of life occur.

The first aim of the NPSE is to avoid significant adverse effects, taking into account the guiding principles of sustainable development (as referenced in Section 1.8 of the Statement). The second aim seeks to provide guidance on the situation that exists when the potential noise impact falls between the LOAEL and the SOAEL, in which case:

"...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".

Importantly, the NPSE goes on to state:

"This does not mean that such adverse effects cannot occur".

The Statement does not provide a noise-based measure to define SOAEL, acknowledging that the SOAEL is likely to vary depending on the noise source, the receptor and the time in question. NPSE advises that:

² Noise Policy Statement for England, Defra, March 2010

"Not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available"

It is therefore likely that other guidance will need to be referenced when applying objective standards for the assessment of noise, particularly in reference to the SOAEL, whilst also taking into account the specific circumstances of a proposed development.

National Planning Policy Framework

The National Planning Policy Framework (NPPF³) initially published in March 2012, was updated most recently in February 2025. One of the documents that the NPPF replaces is Planning Policy Guidance Note 24 (PPG 24) "Planning and Noise"⁴.

The revised NPPF advises that the planning system has three overarching objectives, which are interdependent and need to be pursued in mutually supportive ways (so that opportunities can be taken to secure net gains across each of the different objectives). One of these is an environmental objective which is described in par. 8 (c):

"to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy."

At par. 187 we are advised that:

"Planning policies and decisions should contribute to and enhance the natural and local environment by:

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans..."

Par. 198 goes on to state:

³ National Planning Policy Framework, Ministry of Housing, Communities and Local Government, December 2024

⁴ Planning Policy Guidance 24: Planning and Noise, DCLG, September 1994

“Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;

b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason; ...”

Par. 200 seeks to ensure that any development does not prejudice the legally permitted operations and activities of other, existing non-residential uses, stating:

“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 – Noise

As of March 2014, a Planning Practice Guidance⁵ for noise was issued which provides additional guidance and elaboration on the NPPF, the guidance was updated in July 2019. It advises that when plan-making and decision-taking, the Local Planning Authority should consider the acoustic environment in relation to:

- 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.

⁵ Planning Practice Guidance – Noise, <https://www.gov.uk/guidance/noise--2> 22nd July 2019.

In line with the Explanatory Note of the NPSE, the PPG goes on to reference the LOAEL and SOAEL in relation to noise impact. It also provides examples of outcomes that could be expected for a given perception level of noise, plus actions that may be required to bring about a desired outcome. However, in line with the NPSE, no objective noise levels are provided for LOAEL or SOAEL although the PPG acknowledges that:

“...the subjective nature of noise means that there is not a simple relationship between noise levels and the impact on those affected. This will depend on how various factors combine in any particular situation”.

Examples of these factors include:

- The source and absolute noise level of the source along with the time of day that it occurs;
- Where the noise is non-continuous, the number of noise events and pattern of occurrence;
- The frequency content and acoustic characteristics of the noise;
- The effect of noise on wildlife;
- The acoustic environment of external amenity areas provided as an intrinsic part of the overall design;
- The impact of noise from certain commercial developments such as night clubs and pubs where activities are often at their peak during the evening and night.

The PPG also provides general advice on the typical options available for mitigating noise. It goes on to suggest that Local Plans may include noise standards applicable to proposed developments within the Local Authority's administrative boundary, although it states that:

“Care should be taken, however, to avoid these being implemented as fixed thresholds as specific circumstances may justify some variation being allowed”.

The PPG was amended in December 2014 to clarify guidance on the potential effect of noise from existing businesses on proposed new residential accommodation. Even if existing noise levels are intermittent (for example, from a live music venue), noise will need to be carefully considered and appropriate mitigation measures employed to control noise at the proposed accommodation.

Local Planning Policy

Manchester City Council Planning & Noise Technical Guidance (December 2015) refers to noise from entertainment venues. Section 3.6.1.2 refers to Entertainment Venues and recommends the following criteria:

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}) should be controlled to 10dB below the background noise level (LA_{90}) without the entertainment noise present, in each octave band at the nearest noise sensitive location'.

Appendix 2: Acoustic Standards and Guidance

BS 4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound'

BS 4142:2014+A1:2019⁶ provides guidance on the assessment of the likelihood of complaints relating to noise from industrial sources. It replaced the 1997 edition of the Standard in October 2014 and was amended in June 2019. The amended version corrected a number of printing errors and further clarified that the standard is used to assess external noise levels, and not internal noise levels (although this can form part of the discussion regarding context). The key aspects of the Standard are summarised below.

The standard presents a method of assessing potential noise impact by comparing the noise level due to industrial sources (the Rating Level) with that of the existing background noise level at the nearest noise sensitive receiver in the absence of the source (the Background Sound Level).

The Specific Noise Level – the noise level produced by the source in question at the assessment location – is determined and a correction applied for certain undesirable acoustic features such as tonality, impulsivity or intermittency. The corrected Specific Noise Level is referred to as the Rating Level.

In order to assess the noise impact, the Background Sound Level is arithmetically subtracted from the Rating Level. The standard states the following:

- *Typically, the greater this difference, the greater the magnitude of the impact,*
- *A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context,*
- *A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context,*
- *The lower the Rating Level is relative to the measured Background Sound Level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the Rating Level does not exceed the Background Sound Level, this is an indication of the specific sound source having a low impact, depending on the context.*

⁶ BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound

In addition to the margin by which the Rating Level of the specific sound source exceeds the Background Sound Level, the 2014+A1:2019 edition places emphasis upon an appreciation of the context, as follows:

An effective assessment cannot be conducted without an understanding of the reason(s) for the assessment and the context in which the sound occurs/will occur. When making assessments and arriving at decisions, therefore, it is essential to place the sound in context.

The 2014 edition of BS 4142 also introduced a requirement to consider and report the uncertainty in the data and associated calculations and to take reasonably practicable steps to reduce the level of uncertainty.

Glossary of Terms

Decibel (dB) The unit used to quantify sound pressure levels; it is derived from the logarithm of the ratio between the value of a quantity and a reference value. It is used to describe the level of many different quantities. For sound pressure level the reference quantity is 20 μPa , the threshold of normal hearing is in the region of 0 dB, and 140 dB is the threshold of pain. A change of 1 dB is usually only perceptible under controlled conditions.

dB L_A Decibels measured on a sound level meter incorporating a frequency weighting (A weighting) which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Measurements in dB L_A broadly agree with an individual's assessment of loudness. A change of 3 dB L_A is the minimum perceptible under normal conditions, and a change of 10 dB L_A corresponds roughly to halving or doubling the loudness of a sound. The background noise level in a living room may be about 30 dB L_A ; normal conversation about 60 dB L_A at 1 meter; heavy road traffic about 80 dB L_A at 10 meters; the level near a pneumatic drill about 100 dB L_A .

$L_{A90,T}$ The A weighted noise level exceeded for 90% of the specified measurement period (T). In BS 4142: 2014+A1:2019 it is used to define background noise level.

$L_{Aeq,T}$ The equivalent continuous sound level. The sound level of a notionally steady sound having the same energy as a fluctuating sound over a specified measurement period (T). $L_{Aeq,T}$ is used to describe many types of noise and can be measured directly with an integrating sound level meter.

L_{Amax} The highest A weighted noise level recorded during the time period. It is usually used to describe the highest noise level that occurred during the event.

NOEL No observed effect level: the level of noise exposure below which no effect at all on health or quality of life can be detected.

LOAEL Lowest observed adverse effect level: the level of noise exposure above which adverse effects on health or quality of life can be detected.

SOAEL Significant observed adverse effect level: the level of noise exposure above which significant adverse effects on health or quality of life can be detected.

R_w Single number rating used to describe the sound insulation of building elements and is defined in BS EN ISO 10140-2: 2010 (formerly BSEN ISO 140-3:1995). It is derived by measurement under laboratory conditions and does not take into account the effects of flanking transmissions.

$D_{nT,w}$ The weighted standardized level difference is a single figure rating used to describe the sound insulation of a construction separating two rooms, for example a wall or floor, and is defined in BS EN ISO 16283-1:2014 (formerly BSEN ISO 140-4:1998). It is derived by measurement of an in-situ construction and therefore takes into account the effects of flanking transmissions, workmanship etc.

$D_{ne,w}$ The weighted element-normalized level difference is a single figure rating used to describe the sound insulation of small elements within a larger construction and is defined in BS EN ISO 10140-2:2010 (BSEN ISO 140-10:1991). It is most often used to rate the sound insulation performance of ventilator units e.g. trickle vents.

C_{tr} A single-number spectrum adaptation term used to characterise the sound insulation rating with respect to urban traffic. It is defined in ISO 717-1:20-13.

