

# Diecast Manchester

## Noise Impact Assessment Report

**Client:**

Diecast Limited  
3 Greengate Cardale Park  
Harrogate, HG3 1GY

**Date:**

18 May 2025

**Our Ref:**

22198-RP-1-R2



**JAMESON  
ACOUSTICS**

Consultants in acoustics,  
noise and vibration

Document Control

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| 1        | 27-02-2025 | AJ     | Capturing comments from team.        |
| 2        | 18-05-2025 | AJ     | Update to capture comments from MCC. |
|          |            |        |                                      |

This report has been prepared with all reasonable skill, care and diligence for the sole benefit, use and information of the aforementioned Client in accordance with the purposes and terms agreed between ourselves and the Client. The liability of Jameson Acoustics Limited in respect of the information contained within this report will not extend to any third party.

|                |                                                                                     |
|----------------|-------------------------------------------------------------------------------------|
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| Date           | 18-05-2025                                                                          |

## Executive Summary

Full planning permission is sought for the operation of Diecast, an entertainment venue on Ducie Street in Manchester. The venue is currently operating under temporary planning permission which expires later this year.

The key acoustic issue arising from the operation of the venue is entertainment noise breakout from a number of internal event spaces. This forms the primary focus of this report, although guidance is also provided on plant noise emissions and best practice means for the noise management plan (including noise from patrons entering/exiting the venue). Note, a separate Crowd Management Plan shall be submitted as part of this application.

In order to control music noise breakout levels to satisfy the limits, a detail strategy for the acoustic treatment of the venue has been set out, and maximum permissible internal music noise limits have been assigned for each event space.

To ensure the limits are adhered to, electronic noise limiters shall be used. The limiters shall be set and calibrated through a process of pre-operation acoustic commissioning testing. The Local Authority may wish to secure this through a suitably worded condition of planning.

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## 1.0 Introduction

Full planning permission is sought for the operation of Diecast, an entertainment venue on Ducie Street in Manchester. The venue is currently operating under temporary planning permission which expires later this year.

The key acoustic issue arising from the operation of the venue is entertainment noise breakout from a number of internal event spaces. This forms the primary focus of this report, although guidance is also provided on plant noise emissions and best practice means for the noise management plan (including noise from patrons entering/exiting the venue). Note, a separate Crowd Management Plan shall be submitted as part of this application.

In relation to entertainment noise egress, this report aims to:

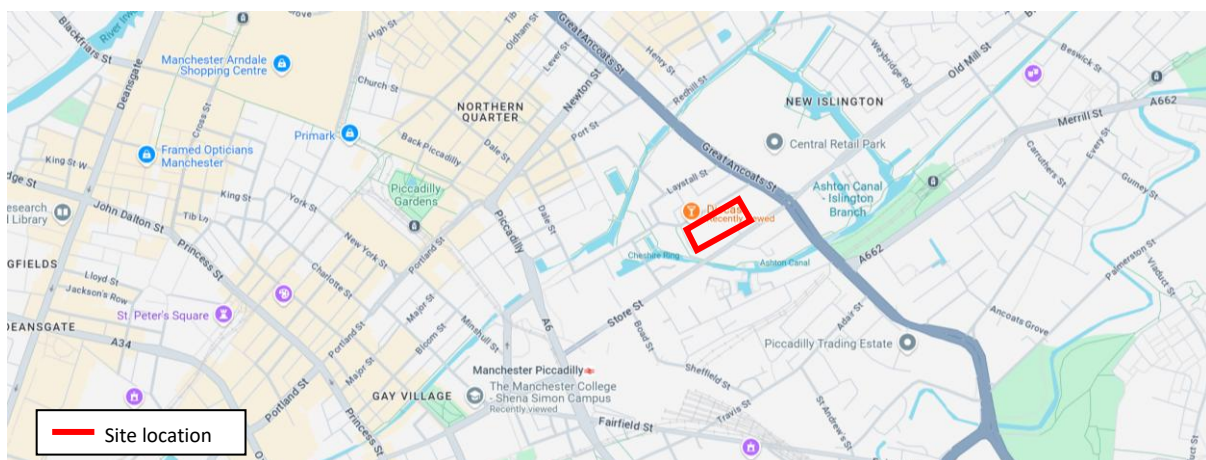
- Present the results of a noise level survey of the venue's current operational noise output, as well as the results of a baseline (background) noise level survey,
- Set appropriate entertainment noise limits based on the results of the background noise level survey,
- Advise on 'realistic' acoustic treatment and enhancements to the venue to help better contain noise levels within the venue,
- Set appropriate entertainment (music) noise limits for each internal event space.

For a description of the acoustic terminology used herein, please see Appendix A.

## 2.0 Site Description

### 2.1 Location

The site is located in between Ducie Street and Store Street in Manchester and falls under the jurisdiction of Manchester City Council. See Location Plan below.



Location Plan (© maps.google.co.uk)

## 2.2 Development Description

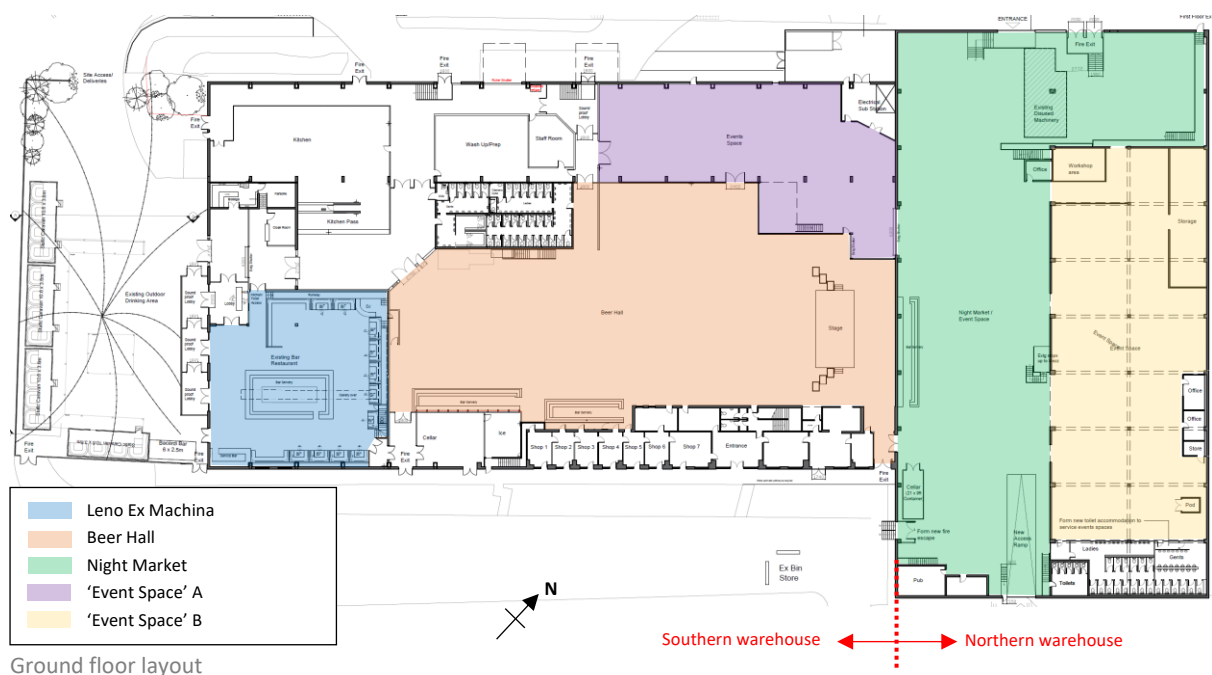
The facility is a former industrial unit comprising large internal warehouse spaces with supporting office accommodation. The warehouse spaces have been converted into event spaces with bars and kitchens. The offices have been retained for office use only.

Temporary planning permission was granted for the facility on 31 May 2022 with a condition imposed relating to the control of music noise breakout to nearby noise sensitive residential receptors, including commissioning noise studies to set music noise limiters in event spaces. Currently, it is acknowledged that these limiters may not be being used effectively, and our proposals therefore include for an investigation and re-commissioning of all noise limiters in the venue.

The facility can be split into two distinct zones:

- the southern warehouse, which is currently in use and includes two main event spaces (Leno Ex Machina and the Beer Hall) with main support offices, a main kitchen with internal dining/circulation zones, toilets, and a F&B outdoor courtyard to the south (primarily for summer use). A new event space will be formed (referenced Event Space A) in what is currently a large storeroom and,
- the northern warehouse, which is not yet in use but includes event spaces (as captured in the original temporary planning consent) including what is referenced as the 'Night Market'. A second event space (referenced Event Space B) shall be formed within this warehouse, segregated from the night market. This event space will be a ground floor level, directly beneath first floor office accommodation. Further toilet facilities will be provided off this event space.

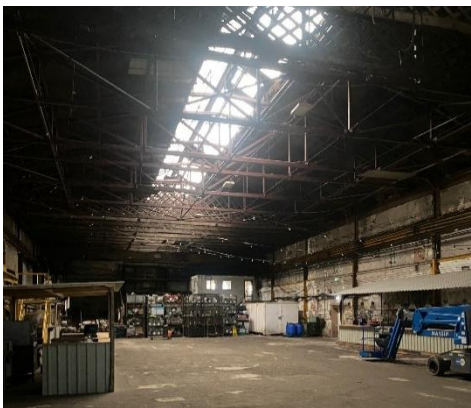
The following ground floor site plan illustrates the full layout (at ground floor level) - event spaces highlighted.



The facility will continue to operate within its current opening hours, as follows:

- Monday: Closed
- Tuesday: Closed
- Wednesday: 16:00-23:00hr
- Thursday: 16:00-00:00hr
- Friday: 16:00-01:00hr
- Saturday: 12:00-01:00hr
- Sunday: 12:00-23:00hr

A description of each event space is provided below:

| Space           | Visual (As Current)                                                                 | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Leno Ex Machina |   | <p>A bar/restaurant space used predominantly for table serve food and drinks with ambient music. The space can become lively for a limited period in the late evenings (typically between 9-11pm on weekdays and 8-11pm on weekends) with 'in-house' DJs.</p> <p>Music is played through cable hung loudspeakers over the DJ booth, with wall mounted repeater speakers and concealed floor mounted sub-woofers.</p> <p>The space is exposed to the lightweight roof structure. It has upgraded (acoustically lined) external walls and lobbied entrance/exit doors. During 'lively' periods, access into the front elevation glass lobby seating area is restricted. At the main entrance, a large acoustic shutter is deployed, ensuring at least two doors separate the space from the entrance lobby.</p>                |
| Beer Hall       |  | <p>A large flexible space, acting predominantly as a bar/restaurant with dining seating/tables and ambient music. In the evenings, the space becomes more of a beer hall with an 'in-house' DJ playing music through an array of loudspeakers (repeaters) mounted on a gantry and perimeter walls.</p> <p>Occasionally, the space may have live music (in-house bands playing ambient music rather than touring acts) using temporary stage and an independent sound system.</p> <p>The space is exposed to the lightweight roof structure. It is centrally positioned, with buffer spaces (offices or storerooms/circulation) to the perimeters with only a small section exposed to an external wall (north-east corner fire escape). All internal entrance doors onto this space are acoustically-sealed metal doors.</p> |
| Night Market    |  | <p>Currently a disused warehouse, the Night Market will include numerous F&amp;B outlets and seating areas. The intention is for this to be an 'ambient' space, with controlled levels of background music (no live performances). The focus is to create a comfortable, family friendly space for dining and socialising.</p> <p>The space is exposed to the lightweight roof structure (containing rooflights), which is all due to be upgraded prior to operation. External walls are all formed by multi-layers of solid brickwork.</p> <p>Any external openings in the roof and external walls will be sealed as required for noise breakout control. Fire escape doorways will be lobbied.</p>                                                                                                                         |

| Space         | Visual (As Current)                                                                | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|---------------|------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Event Space A |   | <p>Currently a storeroom, Event Space A will be exposed to the lightweight roof structure and an elevation of external wall onto the Ducie Street side of the site.</p> <p>The external wall is currently blockwork to lower level with a single skin of metal cladding above. The proposal will be to enhance the cladding element to facilitate event noise.</p> <p>This space is considered an extension of the Night Market with seating areas for dining. The internal separating elements will be enhanced as necessary to prevent noise spill from the adjacent Beer Hall. A lobby will be introduced for all ingress/exit points serving the space.</p>                                                      |
| Event Space B |  | <p>Located off the Night Market, within a masonry formed workshop area beneath first floor offices (zone highlighted red), Event Space B will be used for in-house DJs.</p> <p>The space is 'landlocked' within the building and not exposed directly to any external building fabric elements, thus effectively creating a 'contained' zone for amplified music.</p> <p>Openings linking to the Night Market will be sealed with lobbies to control noise spill.</p> <p>This space will share a party wall with the adjacent Stocktons Home Furniture showroom. The intention is for this space to only operate (with any notable noise levels) later into the evening, outside of Stocktons operational hours.</p> |

2.3 Surroundings

The facility is surrounded on most sides by residential properties in the form of either existing or proposed (consented) apartment buildings.

The following Site Plan highlights the nearest and most exposed existing residential properties around the site.



Site plan showing site & nearest noise sensitive residential receptors

Proposed (consented) residential development schemes near to the site are listed below, with planning reference number provided.

- Central Retail Park: 141607/FO/2024.
- Laystall Street: 135662/FO/2022.
- 32-34 Laystall Street: 128911/FO/2020.
- Ducie Street: 120149/FO/2018.
- Pollard Street: 128191/FO/2020.
- Store Street: 126608/FO/2020.
- Sparkle Street: 139986/FO/2024.
- Chapeltown Street: 132214/FO/2021.
- Eider House: 115178/FO/2017.

These new receptors are best illustrated on the below 3D image provided by SimpsonHaugh. Note, the image contains a high-rise development on the current Stocktons site to the north of Diecast. However, no formal planning application has been made for this scheme and thus this potential future receptor has been excluded. Diecast has been operating as an entertainment venue since 2022 and therefore any future application for the Stocktons site should capture current music noise output (or make reference to Diecast music noise based on limits detailed herein).

Note that none of the supporting Noise Assessment Reports for the above applications make reference to entertainment noise from Diecast. For those pre-2022, their reports pre-date the opening of Diecast as an entertainment venue. For those post-2022, namely Sparkle Street and Central Retail Park, Diecast will have

been operational and the omission of any reference to music noise is perhaps an indication that these receptors are a sufficient distance from the site that Diecast is not a prevalent noise source.

The two consented schemes of most interest due to proximity to Diecast are labelled 'Ducie Street' and 'Store Street' on the below Figure, as these receptors are closer to the venue than any existing receptor. Both schemes are under construction at the time of writing, although 'Ducie Street' appears to be approaching completion and thus the assumption is that this may be occupied later this year.

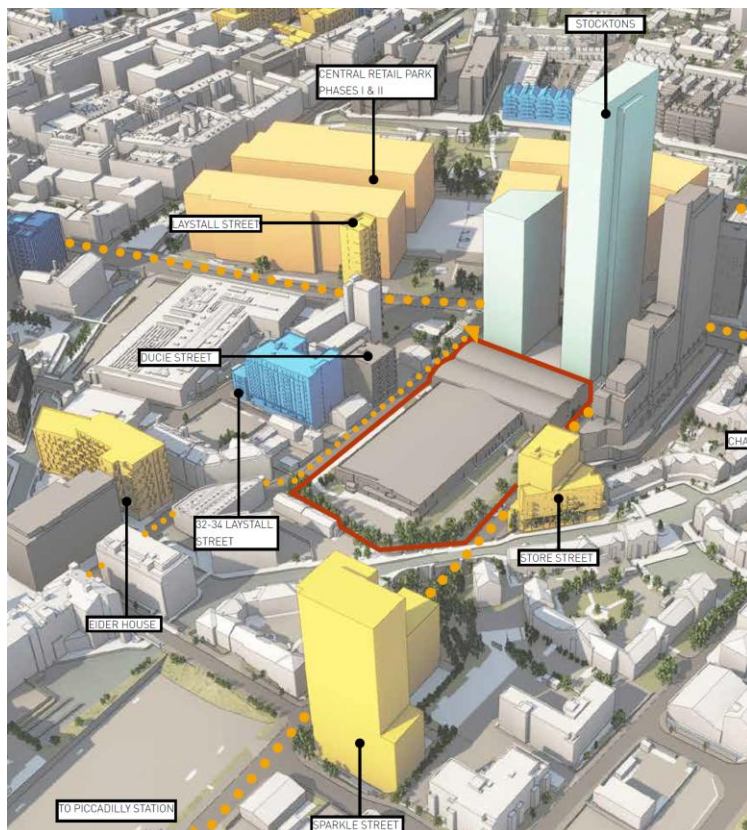


Figure showing consented residential schemes in the area, excluding Stocktons (c/o SimpsonHaugh)

## 3.0 Planning Policy, Legislation & Guides

### 3.1 National Planning Policy

National planning policies are set out in the following:

- Noise Policy Statement for England [NPSE], 2010;
- National Planning Policy Framework [NPPF], 2024;
- National Planning Practice Guidance – Noise [PPGN], 2019.

These documents provide a qualitative approach to noise assessments. See Appendix B for a detailed description of each.

## 3.2 Local Planning Requirements

### 3.2.1 Local Authority Development Plan

Manchester City Council's [MCC] Core Strategy was adopted on the 11 July 2012 and is the key document in the Manchester Local Plan. It sets out the long-term strategic policies for Manchester's future development and will form the framework that planning applications will be assessed against.

The Core Strategy requests that all new developments follow the 'Development Principles' and accord with the design guidance set out in the Supplementary Planning Documents. In accordance with Policy DM1, this includes the effects on amenity due to noise generated by a new development and, conversely for noise sensitive uses (e.g. residential), the effects of environmental noise onto the new development.

MCC's Supplementary Planning Document relating to noise is their 'Planning & Noise, Technical Guidance' published in October 2022 by their Environmental Protection Team. This document provides guidance to applicants and consultants concerning the assessment and prediction of environmental noise associated with a particular development. The key elements relevant to this development are summarised below.

### 3.2.2 Specific Guidance on Noise

In relation to noise generated by entertainment venues, MCC advises consultants to consider the overall noise level ( $L_{Aeq}$ ) and the 63 Hz and 125 Hz octave band noise levels ( $L_{eq}$ ).

It states that *"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"*. To achieve this, the document advises that:

**'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'**

At low frequency, a criterion that would achieve a condition of 'inaudible' / 'virtual inaudible' would be as follows. Note, this criterion is intended for structurally-connected receptors, but the document states that this criterion may also be used for residential developments that are structurally separate from an existing entertainment venue.

**'Music noise levels in the 63Hz and 125Hz octave centre frequency bands ( $L_{eq}$ ) should be controlled so as not to exceed (in habitable rooms) 47dB and 41dB ( $L_{eq,5min}$ ), respectively'**

In relation to commercial noise, MCC's guidance advises that *"BS 4142 should be used to assess the likely impact of noise from industrial and commercial sources at noise sensitive premises"*. The Council consider that new developments should contribute and enhance the area in which they are located and where possible, i.e. prevent 'noise creep', contribute to the improvement of people's health and quality of life as per the NPSE. For fixed plant, the Council advises a BS 4142 assessment that demonstrates that:

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

3.3     **Assessment Guides**

For planning and noise, the following industry standards and assessment guides shall be considered.

- ISO 9613-1: 1993 ‘Acoustics - Attenuation of sound during propagation outdoors: Part 1: Calculation of the absorption of sound by the atmosphere’.
- ISO-9613-2: 2024 ‘Acoustics – Attenuation of sound during propagation outdoors: Part 2: Engineering method for the prediction of sound pressure levels outdoors’,
- NANR45 ‘Procedure for the assessment of low frequency noise complaints, Rev 1’ Moorhouse et al.
- BS 4142: 2014+A1: 2019 ‘Methods for Rating and Assessing Industrial and Commercial Sound’.

In relation to the latter, BS 4142 looks at the assessment of noise of a commercial / industrial nature. It describes methods for rating and assessing outdoor sound of an industrial and/or commercial nature “on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident”. In relation to this development, this includes sound from fixed installations, comprising M&E plant and equipment.

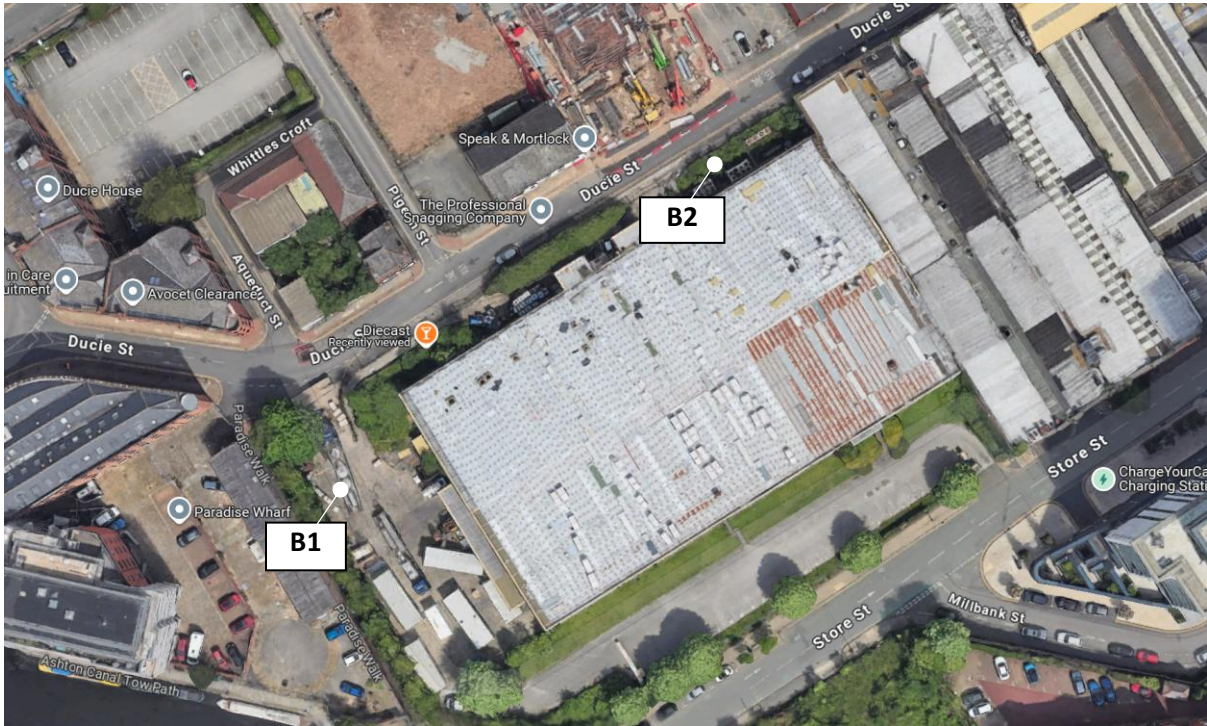
The assessment method is based on the difference between the measured ‘background sound level’ without the influence of any industrial noise source, and the ‘rating level’ of the industrial source, at the receiver location. A difference of around +10 dB or more is likely to be an indication of a significant adverse impact. A difference of around +5 dB is of marginal significance, and where the rating level does not exceed the background, this is an indication of the specific sound source having a low impact.

4.0     **Baseline (Background) Noise Survey**

4.1     **Procedure**

Automated noise level measurements were taken from 12:00 hours on Monday 10 February 2025 to 11:00 hours on Wednesday 12 February 2025 at 2nr on-site positions as described below. Both positions were selected to establish the typical prevailing daytime and night-time background noise levels around the site.

| Position | Type      | Description                                                                                                                                                                                    |
|----------|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| B1       | Automated | Microphone positioned in the southern courtyard of Diecast, approx. 20 m from the roadside edge of Ducie Street. Microphone mounted approx. 3.5 m above ground level in free-field conditions. |
| B2       | Automated | Microphone positioned on the Ducie Street edge of the site, approx. 5 m from the roadside edge of Ducie Street. Microphone mounted approx. 3.5 m above ground level in free-field conditions.  |



Site Plan showing background noise survey measurement positions (© maps.google.co.uk)

The equipment was programmed to continuously log all relevant A-weighted broadband (dBA) and linear spectral noise level indices, including  $L_{eq}$ ,  $L_{90}$ ,  $L_{10}$  and  $L_{max}$ , over intervals of 5-minutes.

All measurements were taken in general accordance with BS 7445-1: 2003 ‘Description and Measurement of Environmental Noise’.

4.2 Instrumentation

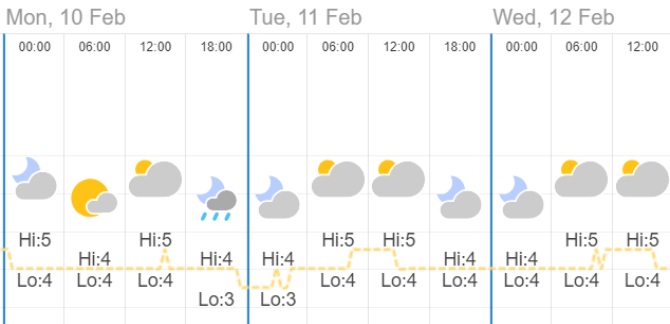
The instrumentation used for the surveys is summarised below. The sound level meters were hand-calibrated at the beginning and end of each survey period. No significant deviations in calibration level were noted.

| Description               | Equipment                                   | Serial Nr              | Lab Calibration Expiry |
|---------------------------|---------------------------------------------|------------------------|------------------------|
| Class 1 sound level meter | Casella CEL 633C (w/ 495 pre-amp & 251 mic) | 0721320 (001414, 1025) | 07-11-2025             |
| Class 1 sound level meter | Casella CEL 633C (w/ 495 pre-amp & 251 mic) | 0721319 (001446, 1996) | 07-11-2025             |
| Class 1 sound calibrator  | Casella 120/1                               | 3864878                | 31-10-2025             |

4.3 Weather Conditions

Due to the nature of the survey, i.e. unmanned, it is not possible to describe the weather conditions throughout the duration of the measurement period. However, at the beginning and end of the survey period, weather conditions were suitable for obtaining representative readings, with no rainfall, dry road surfaces and

low wind speeds (within tolerance of the windshields). Internet weather reports indicate some periods of ‘light rain’ on the evening of Monday 10 February 2025, but otherwise suitable weather conditions, as below.



4.4 Observed Noise Climate

Due to the nature of the survey, i.e. unmanned, it is not possible to describe the noise climate throughout the duration of the measurement period. However, at the beginning and end of the survey period the noise climate was noted to be dominated by road traffic comprising distant traffic and local vehicular movements on Ducie Street. NB: The survey was undertaken at a time when the Diecast venue was closed to obtain true background noise readings, uninfluenced by music noise.

4.5 Results & Analysis

The results of Position B1 are considered to be representative of background noise levels for existing residential receptors set back from road traffic sources, e.g. rear elevations of Paradise Wharf and Jutland Street apartments. The results of Position B2 are considered to be representative of background noise levels for any residential receptor facing directly onto a road (either Ducie Street or Store Street).

The results of the background noise survey have been plotted on Time History Graphs 22198-B1 and 22198-B2 enclosed in Appendix C. The graphs present the 5-minute A-weighted (dBA) L<sub>90</sub>, L<sub>eq</sub> and L<sub>max</sub> levels at each position throughout the duration of the survey.

The background noise level results have been statistically analysed, and the following table presents the ‘typical’ daytime and night-time background noise levels for the purpose of setting music noise limits. Time periods have been selected to represent typical opening times of Diecast (e.g. ca. 4pm to 1am).

The following table summarises the ‘representative’ background noise levels obtained through statistical analysis for the purpose of setting plant noise limits.

| Position                           | Free-Field Background Noise Level (dB)        |                                                               |                                                                 |
|------------------------------------|-----------------------------------------------|---------------------------------------------------------------|-----------------------------------------------------------------|
|                                    | Daytime L <sub>A90,1hr</sub><br>(07:00-23:00) | Night-time L <sub>A90,15min</sub><br>(23:00-01:00) venue open | Night-time L <sub>A90,15min</sub><br>(01:00-07:00) venue closed |
| B1 – receptors set back from roads | 50                                            | 42                                                            | 39                                                              |
| B2 – receptors on roadsides        | 49                                            | 41                                                            | 38                                                              |

The following table summarises the ‘typical’ background noise level in each octave band during typical daytime and night-time periods when the venue is operational. These readings are for the purpose of setting music noise limits.

| Position                           | Period                | Typical Free-field Background Noise Level $L_{eq,5min}$ (dB) at OBCF (Hz) |     |     |     |    |    |    |
|------------------------------------|-----------------------|---------------------------------------------------------------------------|-----|-----|-----|----|----|----|
|                                    |                       | 63                                                                        | 125 | 250 | 500 | 1k | 2k | 4k |
| B1 – receptors set back from roads | Day (16:00-23:00hr)   | 55                                                                        | 49  | 47  | 46  | 46 | 40 | 30 |
|                                    | Night (23:00-01:00hr) | 50                                                                        | 42  | 41  | 38  | 38 | 33 | 21 |
| B2 – receptors on roadsides        | Day (16:00-23:00hr)   | 55                                                                        | 49  | 47  | 46  | 46 | 40 | 31 |
|                                    | Night (23:00-01:00hr) | 51                                                                        | 44  | 41  | 39  | 39 | 33 | 22 |

## 5.0 Hoare Lea Baseline (Background) Noise Survey

A baseline noise survey was carried out by Hoare Lea in November 2021 to inform a noise assessment for the development’s original temporary planning consent. Their survey was carried out over a period of 4 days between 4 November and 8 November 2021 (prior to the venue opening). The survey period included a weekend.

The full survey methodology and results are presented in their Planning Noise Assessment Report Revision 03 – 24 March 2022. Readings were taken at 2nr ‘free-field’ positions as illustrated below.



Hoare Lea background survey measurement positions

In line with BS 4142:2014, for the purpose of analysis and establishing representative background noise levels during the periods of interest, the background noise levels were quantified using statistical analysis from the continuous logging measurements. For their analysis, the following table summarises their daytime and night-time background noise levels.

| Position                  | Free-Field Background Noise Level (dB) |                                         |
|---------------------------|----------------------------------------|-----------------------------------------|
|                           | Daytime $L_{A90,5min}$ (07:00-23:00)   | Night-time $L_{A90,5min}$ (23:00-07:00) |
| L1 – Store St             | 45                                     | 39                                      |
| L2 – Ducie St / Courtyard | 42                                     | 37                                      |

For the purpose of the music noise breakout assessment, consideration shall be given to the representative octave band background noise levels during time periods when the venue is operational. The raw data from the Hoare Lea survey has been obtained, and this has been used to adjust the statistically analysed data presented in the Hoare Lea report for full 16-hr daytime and 8-hr night-time periods, considering only the venue opening hours of 12:00-01:00hr. These adjustments are summarised below.

Table 2 Position L1 - Octave band representative background noise level

|                                                                 | Octave Band Centre Frequency (Hz) |                            |                            |                            |                            |                            |                            |
|-----------------------------------------------------------------|-----------------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
|                                                                 | 63                                | 125                        | 250                        | 500                        | 1k                         | 2k                         | 4k                         |
| Daytime / evening (07:00 - 23:00)<br>$L_{eq}$ (dB) <b>12:00</b> | <del>57</del><br><b>58</b>        | <del>47</del><br><b>48</b> | <del>42</del><br><b>44</b> | <del>42</del><br><b>44</b> | <del>42</del><br><b>44</b> | <del>35</del><br><b>38</b> | <del>23</del><br><b>26</b> |
| Night (23:00 - 07:00)<br>$L_{eq}$ (dB) <b>01:00</b>             | <del>52</del><br><b>52</b>        | <del>42</del><br><b>43</b> | <del>37</del><br><b>38</b> | <del>36</del><br><b>37</b> | <del>35</del><br><b>37</b> | <del>27</del><br><b>30</b> | <del>15</del><br><b>19</b> |

Table 4 Position L2 - Octave band representative background noise level

|                                                                 | Octave Band Centre Frequency (Hz) |                            |                            |                            |                            |                            |                            |
|-----------------------------------------------------------------|-----------------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
|                                                                 | 63                                | 125                        | 250                        | 500                        | 1k                         | 2k                         | 4k                         |
| Daytime / evening (07:00 - 23:00)<br>$L_{eq}$ (dB) <b>12:00</b> | <del>55</del><br><b>55</b>        | <del>45</del><br><b>45</b> | <del>40</del><br><b>41</b> | <del>39</del><br><b>40</b> | <del>38</del><br><b>40</b> | <del>31</del><br><b>33</b> | <del>18</del><br><b>21</b> |
| Night (23:00 - 07:00)<br>$L_{eq}$ (dB) <b>01:00</b>             | <del>52</del><br><b>52</b>        | <del>42</del><br><b>42</b> | <del>36</del><br><b>37</b> | <del>35</del><br><b>36</b> | <del>34</del><br><b>35</b> | <del>24</del><br><b>26</b> | <del>13</del><br><b>15</b> |

$L_{A90,5min}$  representative background noise levels (Hoare Lea survey)

A comparison of the two background survey data sets indicates lower background readings were obtained during the Hoare Lea survey. Whilst it is therefore prudent to adopt the Hoare Lea data set to inform a worst-case assessment, we would question the validity/reliability of their readings. The survey was undertaken over 3 years ago, and at the time, the country had only just come out of a period of COVID19 lockdown.

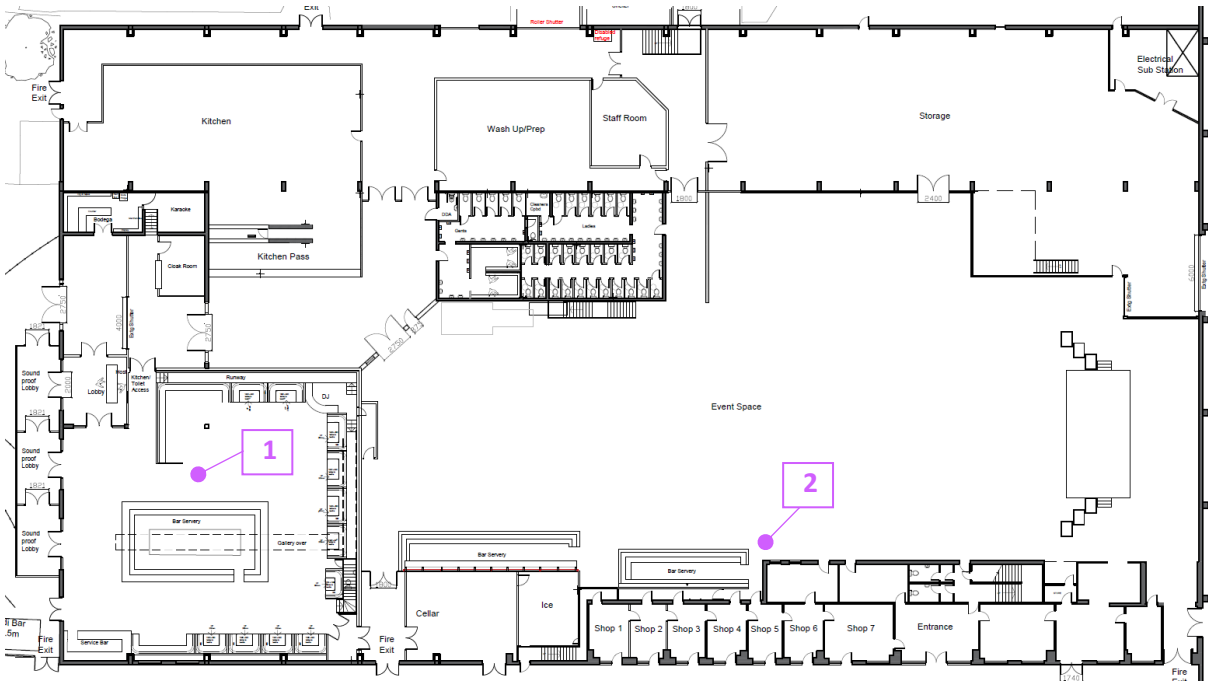
Whilst the Hoare Lea background data shall be used herein, a fresh detailed background noise survey is required to provide certainty, with positions and survey duration agreed with MCC in advance.

6.0 Event Noise Survey (Current Operations)

6.1 Procedure

A detailed noise level survey was carried out to determine the current levels of music noise experience internally and externally during a busy Christmas party night at Diecast on Friday 20 December 2024. The survey comprises a combination of automated (internal and external) and manned (internal) noise level measurements, as described below. Automated measurements were taken from 12:00 hr on Friday 20 December 2024 through to the following morning. Internal manned measurements were taken between 21:00-23:00 hr on Friday 20 December 2024.

| Position | Type                 | Description                                                                                                                                                                                                     |
|----------|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1        | Internal (Automated) | Microphone positioned at high level in Leno Ex Machina. Microphone attached to drop rod supporting planters approx. 5 m above floor level (ca. 2 m from underside of roof).                                     |
| 2        | Internal (Automated) | Microphone positioned at high level in Beer Hall. Microphone attached to first floor balustrade drop rod supporting planters approx. 5 m above ground floor level (ca. 2m from underside of roof).              |
| 3        | External (Automated) | Microphone positioned on the roof of the building on the Ducie Street edge of the site. Microphone approx. 1.5 m above roof level in free-field conditions.                                                     |
| 4        | External (Automated) | Microphone positioned in the southern courtyard of Diecast, approx. 20 m from the roadside edge of Ducie Street. Microphone mounted approx. 3 m above ground level in free-field conditions.                    |
| -        | Internal (Manned)    | Handheld measurements taken at ear-height in various internal spaces. In each test room, 'sweep' measurements were taken to obtain a reverberant room spatial average at listener height over 5-minute periods. |





Site Plan showing background noise survey measurement positions (© maps.google.co.uk)

The automated equipment was programmed to continuously log all relevant A-weighted broadband (dBA) and linear spectral noise level indices, including  $L_{eq}$ ,  $L_{90}$ ,  $L_{10}$  and  $L_{max}$ , over intervals of 5-minutes intervals. The manned equipment was programmed to manual record the same parameters.

6.2 Instrumentation

The instrumentation used for the surveys is summarised below. The sound level meters were hand-calibrated at the beginning and end of each survey period. No significant deviations in calibration level were noted.

| Description               | Equipment                                | Serial Nr         | Lab Calibration Expiry | Lab Calibration Certificate Nr |
|---------------------------|------------------------------------------|-------------------|------------------------|--------------------------------|
| Class 1 sound level meter | Cirrus CR:171B (with MK:224 microphone)  | G056718 (204055A) | 12 Nov 2025            | 1171320                        |
| Class 1 sound level meter | Svantek 971A (with Type 7152 microphone) | 124663 (82835)    | 26 Aug 2026            | 1509611-1                      |
| Class 1 sound level meter | Svantek 971A (with Type 7152 microphone) | 131635 (85533)    | 4 Nov 2026             | 1510429-1                      |
| Class 1 sound level meter | Svantek 971A (with Type 7152 microphone) | 127647 (84398)    | 12 Mar 2025            | 13 Mar 2023                    |
| Class 1 sound level meter | Svantek 971A (with Type 7152 microphone) | 131642 (85571)    | 26 July 2025           | 26 July 2023                   |

| Description              | Equipment     | Serial Nr | Lab Calibration Expiry | Lab Calibration Certificate Nr |
|--------------------------|---------------|-----------|------------------------|--------------------------------|
| Class 1 sound calibrator | Cirrus CR:515 | 57570     | 12 Nov 2025            | 1171319                        |

6.3 Weather Conditions

Due to the nature of the survey, i.e. unmanned, it is not possible to describe the weather conditions throughout the duration of the measurement period. However, at the beginning and end of the survey period, weather conditions were suitable for obtaining representative readings, with no rainfall, dry road surfaces and low wind speeds (within tolerance of the windshields). Internet weather reports indicate a brief period of ‘light rain’ between 20:00-20:30 hr on Friday 20 December 2024.

6.4 Observed Noise Climate

Due to the nature of the survey, i.e. unmanned, it is not possible to describe the noise climate throughout the duration of the measurement period. However, at the beginning and end of the survey period the noise climate was noted to be dominated by road traffic comprising distant traffic and local vehicular movements on Ducie Street. NB: The survey was undertaken at a time when the Diecast venue was closed to obtain true background noise readings, uninfluenced by music noise.

6.5 Results & Analysis

The following tables summarise the typical highest recorded noise levels (at peak operation) at the internal automated monitoring positions and the typical highest internal manned spatial average measurements. Note, the survey demonstrates that operational music noise level only reached/approached these peak operational noise levels for a limited period of time – a few hours in the late evening.

Before then (i.e. the majority of the operational hours, music noise levels at the more dominant low frequencies were typically 10-15 dB lower, which aligns with the description of operational trends provided in Section 2.2.

Internal – Fixed Monitoring Positions (High Level)

| Position            | Activity                                  | Fixed Position Noise Level $L_{eq,5min}$ (dB) at OBCF (Hz) |     |     |     |    |    |    |
|---------------------|-------------------------------------------|------------------------------------------------------------|-----|-----|-----|----|----|----|
|                     |                                           | 63                                                         | 125 | 250 | 500 | 1k | 2k | 4k |
| 1 (Leno Ex Machina) | Amplified DJ main set (ca. 90% occupancy) | 94                                                         | 94  | 88  | 90  | 90 | 85 | 78 |
| 2 (Beer Hall)       | Live band (ca. 50% occupancy)             | 91                                                         | 92  | 93  | 95  | 92 | 86 | 81 |
|                     | Amplified DJ (ca. 50% occupancy)          | 88                                                         | 89  | 87  | 88  | 88 | 83 | 78 |

## Internal – Manned Measurements at Listener Positions

| Position            | Activity                                  | Spatial Average Noise Level $L_{eq,5min}$ (dB) at OBCF (Hz) |     |     |     |    |    |    |
|---------------------|-------------------------------------------|-------------------------------------------------------------|-----|-----|-----|----|----|----|
|                     |                                           | 63                                                          | 125 | 250 | 500 | 1k | 2k | 4k |
| 1 (Leno Ex Machina) | Amplified DJ main set (ca. 90% occupancy) | 95                                                          | 95  | 89  | 91  | 91 | 88 | 82 |
| 2 (Beer Hall)       | Live band (ca. 50% occupancy)             | 93                                                          | 95  | 95  | 96  | 94 | 88 | 83 |
|                     | Amplified DJ (ca. 50% occupancy)          | 91                                                          | 92  | 87  | 88  | 88 | 83 | 78 |
| 3 (Kitchen/dining)  | Amplified music (ca. 20% occupied)        | 75                                                          | 76  | 74  | 79  | 78 | 74 | 69 |

The following tables summarise the typical highest noise breakout levels at the external automated monitoring positions during an event. The typical background  $L_{eq,5min}$  noise levels before/after the event (background) are presented, together with the calculated ‘background-corrected’ music noise breakout levels for use in calibrating the noise model.

## External – Fixed Monitoring Positions

| Position      | Desc.                           | Fixed Position Noise Level $L_{eq,5min}$ (dB) at OBCF (Hz) |     |       |       |       |       |       |
|---------------|---------------------------------|------------------------------------------------------------|-----|-------|-------|-------|-------|-------|
|               |                                 | 63                                                         | 125 | 250   | 500   | 1k    | 2k    | 4k    |
| 3 (Roof)      | Music noise breakout (MNB)      | 69                                                         | 66  | 59    | 58    | 56    | 53    | 48    |
|               | Average background              | 60                                                         | 58  | 56    | 56    | 56    | 53    | 48    |
|               | <i>MNB Background corrected</i> | 68                                                         | 65  | 56    | ≤54*  | ≤46*  | ≤43*  | ≤38*  |
| 4 (Courtyard) | Music noise breakout (NMB)      | 64                                                         | 58  | 54    | 56    | 55    | 50    | 43    |
|               | Average background              | 61                                                         | 54  | 53    | 56    | 55    | 50    | 43    |
|               | <i>MNB Background corrected</i> | 61                                                         | 56  | ≤47** | ≤46** | ≤45** | ≤40** | ≤33** |

\* background limited (within 2 dB of ambient background levels)

\*\* background limited & potentially influenced by patron noise

## 7.0 Plant Noise Limits

### 7.1 Plant Noise Limits

Based on the results of the Hoare Lea background noise survey and the requirements of MCC, we propose the following plant noise limits to be achieved ‘incident’ onto the nearest noise sensitive windows with all plant operating simultaneously. These limits are 5 dB below the prevailing ‘representative’ background noise levels.

| Location                          | Free-Field Background Noise Level (dB) |                                         |
|-----------------------------------|----------------------------------------|-----------------------------------------|
|                                   | Daytime $L_{A90,5min}$ (07:00-23:00)   | Night-time $L_{A90,5min}$ (23:00-07:00) |
| Receptors on Store St             | 40                                     | 34                                      |
| Receptors on Ducie St / Courtyard | 37                                     | 32                                      |

Noise shall be assessed in accordance with BS 4142:2014 with corrections applied for any plant emitting noise of a tonal or irregular quality.

The above limits shall be subject to the final approval of MCC.

## 7.2 Plant Noise Mitigation

At this stage, any new plant associated with the northern warehouse works has not been selected so we cannot perform the associated noise emission calculations. However, it is envisaged that the risk of excessive building services noise can be mitigated by design, and this could be secured by a suitably worded condition of planning. The noise reduction/attenuation measures required for external plant will depend on the type and location of the equipment. Typically, provisions should be made for in-duct attenuation to air handling equipment and appropriate positioning/screening of any heat rejection plant (such as condensers).

## 8.0 Music Noise Limits

Based on the results of the Hoare Lea background noise survey and the requirements of MCC, we propose the following music noise limits to be achieved 'incident' onto the nearest noise sensitive windows.

| Location            | Period                | Music noise limit, $L_{eq,5min}$ (dB) at OBCF (Hz) |     |     |     |    |    |    |
|---------------------|-----------------------|----------------------------------------------------|-----|-----|-----|----|----|----|
|                     |                       | 63                                                 | 125 | 250 | 500 | 1k | 2k | 4k |
| Roadside receptors  | Day (12:00-23:00hr)   | 53                                                 | 43  | 39  | 39  | 39 | 33 | 21 |
|                     | Night (23:00-01:00hr) | 47                                                 | 38  | 33  | 32  | 32 | 25 | 14 |
| Courtyard receptors | Day (12:00-23:00hr)   | 50                                                 | 40  | 36  | 35  | 35 | 28 | 16 |
|                     | Night (23:00-01:00hr) | 47                                                 | 37  | 32  | 31  | 30 | 21 | 10 |

The above limits are 5 dB below the prevailing 'representative' background noise levels for octave band centre frequencies 63 Hz to 4 kHz.

These limits will be subject to change upon completion of a fresh detailed background noise survey, with positions/durations agreed with MCC in advance. This detailed survey shall be secured as part of a suitably worded condition of planning. For 63 Hz and 125 Hz, we would propose consideration is given to MCC's absolute noise limits of 47 dB and 41 dB (respectively) inside the dwelling. The sound reduction of a typical bedroom façade with a partially opened window can be obtained using NANR116 '*Open/Closed Window Research – Sound Insulation Through Ventilated Domestic Windows*' to determine appropriate limits at 1m external to windows. These limits would represent the threshold of 'inaudibility/ virtual inaudibility' and are the limits applied to any new residential development subject to existing music noise impacts. Designing to limits below these absolute limits (i.e. the threshold of inaudibility) is likely to lead to unnecessarily restrictive operational noise limits for the venue that would provide little to no tangible acoustic benefit to residents.

## 9.0 Venue Acoustic Treatment

### 9.1 Northern Warehouse – Roof

The existing roof is understood to comprise timber slats with an outer weatherproof (e.g. bitumen) membrane. The central spine of the roof contains corrugated rooflight sheeting on a raised pitch. The proposal is to overclad the entire roof, including the rooflights, with a thermally insulated cavity roof build up as follows:

(top to bottom)

- Double layer weatherproofing felt,
- 12 mm plywood,
- 5 x 2" timbers creating ca.130 mm cavity, fully filled with mineral wool (est. 30-45 kg/m<sup>3</sup>),
- Existing roof elements retained and made good (gaps to be fully sealed with grout/mastic).

For the rooflights, a framed will need to be formed using the timbers, creating a square covering over the existing roof. Prior to installing the frame, the existing roof light structure should be overclad with 12 mm plywood boards. The addition of the frame will then form a sandwich cavity construction over the rooflights. The full void between the lower plywood and the upper plywood should be fully filled with the mineral wool.

Any disused ductwork or other services penetrating through the roof construction should be removed and the existing roof construction made good with equivalent materials (or 12 mm plywood with all joints fully sealed) prior to the installation of the new roof cladding.

#### Alternative roof upgrade

In order to improve the roof performance, it would be necessary to increase the mass of the construction, i.e. the load. Whilst we present an optional acoustic upgrade solution below, it is imperative that the viability of this construction is reviewed by a structural engineer.

(top to bottom)

- Double layer weatherproofing felt,
- **18 mm cementitious board (min. mass per unit area, 20 kg/m<sup>2</sup>),**
- **8" deep timbers creating a min. 200 mm cavity, fully filled with dense mineral wool (ca.80 kg/m<sup>3</sup>),**
- Existing roof elements retained and made good (gaps to be fully sealed with grout/mastic).

With the upgraded roof, the rooflights would still be treated in the same manner, with 12 mm plywood to overclad prior to the installation of the timber frame.

The noise modelling and resultant internal music noise limits within Night Market presented herein shall be based on the 'Proposed' roof construction rather than the upgraded roof proposal in lieu of structural engineer approval. To assist in making a judgement on the acoustic benefits of the upgrade, should the upgrade be structurally viable, we would advise that music noise limits in the Night Market could be increased by the following factors:

| Desc.                                                              | Increase to music noise limit, $L_{eq,5min}$ (dB) at OBCF (Hz) |     |     |     |    |    |    |
|--------------------------------------------------------------------|----------------------------------------------------------------|-----|-----|-----|----|----|----|
|                                                                    | 63                                                             | 125 | 250 | 500 | 1k | 2k | 4k |
| Potential increase to Night Market noise limits with upgraded roof | +4                                                             | +4  | +4  | +4  | +3 | +3 | +3 |

## 9.2 Northern Warehouse – External Walls & Exits

The northern warehouse external walls are formed from solid brick but contains several window openings and a large roller shutter opening to the south gable. These elements shall be treated to maintain the acoustic integrity of the complete façade.

For the windows, we would suggest the openings are boarded over on the internal and external sides with cementitious board (18 mm, min. mass per unit area 20 kg/m<sup>2</sup>). A weatherproof membrane can be applied over the outer skin. The boards should maintain the full cavity depth of the brick wall (estimated to be ca. 300-400 mm). The cavity should be full filled with mineral wool (min. 45 kg/m<sup>3</sup>). All board joints and abutments shall be sealed airtight with a generous application of non-setting mastic.

For the roller shutter, we would propose the shutter is removed and the opening is made good with a brick/block cavity construction to the full depth of the wall. The inner block should be laid 100 mm thick using medium density blockwork (ca. 1,450 kg/m<sup>3</sup>). The outer skin would be formed from traditional brick, 102.5 mm thick, with the cavity depth between the two layers dictated by the overall thickness of the existing wall, but not less than 100 mm. The two masonry skins can be tied with butterfly ties. The cavity should be filled with mineral wool (any density for acoustic performance, but density may be dictated by thermal requirements, if applicable).

### Lobbied doors

Where fire escape doors are required, all doors shall be lobbied. The lobby shall ensure there is at least a 3 m distance between the inner door and outer door. Note, a fire engineer shall be consulted to ensure the arrangement satisfies fire regulations. The lobby shall be constructed from timber/metal stud walls and 'lid'. For the walls, the studs should be deep enough to create a minimum cavity depth of 70 mm. The studs should be double boarded both sides with 15 mm dense plasterboard (e.g. SoundBloc). The cavity should contain 50 mm mineral wool (10-45 kg/m<sup>3</sup>).

For the lid, it is anticipated that a joist floor system would be used (e.g. solid timber or web-joists) providing a cavity depth of at least 100 mm. The joists should be boarded both sides. On the top (outer) side, a floorboard or cementitious board can be used, min. 18 mm thickness providing a minimum mass of 18 kg/m<sup>2</sup>. On the inner (ceiling) side, the joists shall be underdrawn with 2 layers of 15 mm dense plasterboard (e.g. SoundBloc).

The outer door(s) to the lobby shall be suitably fire rated with suitable seals to jambs and be of a solid core timber or metal door set. The 'acoustic line' of protection will be the inner door(s), which shall be acoustic rated door sets with neoprene compression seals to jambs achieving a minimum sound reduction performance of 35 dB  $R_w$  (similar to the metal door sets used elsewhere within the existing southern warehouse spaces).

NB: The first floor lobby fire exit is accessed off a gantry with perforated metal floors, thus, an additional solid metal plate should be fitted to the floor surface in the lobby (min. 20 kg/m<sup>2</sup>, e.g. 2.5 mm steel plate).

9.3 Event Space A – External Walls & Exits

Event Space A (currently a storeroom) comprises an external wall of blockwork to low level and sheet metal cladding to upper level. At present, the sheet metal provides a poor seal against the blockwork, with gaps which would all need to be made good prior to treatment.

The upper clad wall shall be treated with an additional inner skin of metal cladding (steel corrugated sheeting) to form a 100 mm cavity, as has already been applied to other areas of the development. The cavity should be fully filled with mineral wool (min. 45 kg/m<sup>3</sup>). In addition, the internal face of the cladding shall be lined with plasterboard or material of equivalent mass, as applied to the Leno Ex Machina external walls. The lining should comprise a board material (could be timber/plasterboard depending on visual preference) providing a minimum mass per unit area of 12 kg/m<sup>2</sup> (e.g. 1 x 15 mm SoundBloc). The boarding shall be supported on a metal/timber frame off the main structural members to create a cavity depth of not less than 100 mm. This cavity should contain a minimum 100 mm mineral wool quilt (10-45 kg/m<sup>3</sup>).

If a fire escape door is required, the door shall be lobbied. The lobby shall ensure there is at least a 3 m distance between the inner door and outer door. Note, a fire engineer shall be consulted to ensure the arrangement satisfies fire regulations. The lobby shall be constructed as described in Section 8.2.

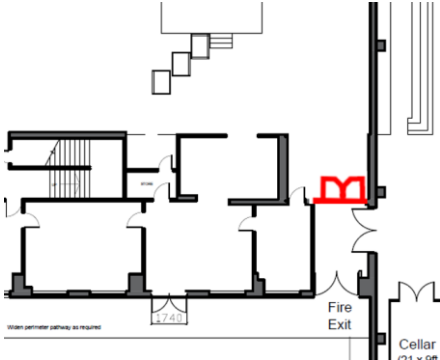
9.4 Internal Walls & Lobbies

Internal separating elements between adjoining event spaces will need to be suitably acoustically treated to control ‘noise spill’. If, for example, the sound insulation between a loud music event space and a more ambient event space was poor, the resultant reverberant noise levels in Event Space A would be unduly elevated. This would not only cause noise interference that would degrade people’s enjoyment of the ambient space but could also artificially increase reverberant noise levels in other areas of the building, thus increasing radiated noise output the nearby receptors. The idea is to contain the noise as best as practically possible in each event space.

To achieve this, we propose the following solutions.

| Location                            | Sketch | Treatment                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------------------------------|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Event Space A southern wall & doors |        | Upper clad wall to be treated with an additional skin of metal cladding (steel corrugated sheeting) to form a 100 mm sandwich cavity, with 100 mm cavity mineral wool (min. 45 kg/m <sup>3</sup> ).<br><br>All penetrations, gaps and holes to be ‘made good’.<br><br>Door in red wall to be rated at 35 dB R <sub>w</sub> (min.).<br><br>Additional door to be introduced to create ‘soundproof’ lobby, as highlighted (red dotted). Well-fitting solid core door. |

| Location                                          | Sketch | Treatment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|---------------------------------------------------|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Event Space A / Beer Hall wall                    |        | <p>Upper clad wall to be treated with an additional skin of metal cladding (steel corrugated sheeting) to form a 100 mm sandwich cavity, with 100 mm cavity mineral wool (min. 45 kg/m<sup>3</sup>).</p> <p>All penetrations, gaps and holes to be 'made good'.</p> <p>Door in red wall to be lobbied or removed. Lobbies formed shall adhere to specification in Section 8.2, with 35 dB <math>R_w</math> (min.) door to the noisier side of the lobby.</p>                                                                                       |
| Lobby to Beer Hall / Event Space A / Night Market |        | <p>Existing roller shutters to be removed and a lobby door arrangement to be introduced, as illustrated.</p> <p>The lobby formed shall adhere to specification in Section 8.2, with 35 dB <math>R_w</math> (min.) door to the noisier side of the lobby, i.e. the Beer Hall.</p> <p>Door in wall highlighted dotted red to be removed and opening sealed with equivalent wall construction (blockwork).</p>                                                                                                                                        |
| Event Space B lobbies                             |        | <p>Lobbies shall be formed to exact opening between Event Space B and Night Market.</p> <p>Lobbies formed shall adhere to specification in Section 8.2; with 35 dB <math>R_w</math> (min.) door to the noisier side of the lobby, i.e. Event Space B.</p> <p>The wall encompassing the 35 dB <math>R_w</math> door (highlighted blue) shall be construction from 140 mm thick medium density blockwork (ca. 1,450 kg/m<sup>3</sup>).</p> <p>The aim should be to stagger the door positioning to maximise separation between the two openings.</p> |
| Event Space B Toilet wall                         |        | <p>The front wall forming the toilets shall be construction from a twin-stud partition system, or 140 mm medium density blockwork (ca. 1,450 kg/m<sup>3</sup>).</p> <p>If the former, the twin-stud wall should be 200 mm thick overall, comprising C-studs (tied) with 50 mm cavity mineral wool and 2 layers of 15 mm dense plasterboard each side (e.g. SoundBloc).</p> <p>The toilet entrance doors shall be well-fitting, solid core doors.</p>                                                                                               |

| Location                        | Sketch                                                                            | Treatment                                                                                                                                                                                                                  |
|---------------------------------|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Beer Hall to Night Market lobby |  | <p>A new door shall be introduced to the rear section of the beer hall, as indicated, to create a lobby onto the fire exit and the Night Market.</p> <p>The new door should be rated at 35 dB <math>R_w</math> (min.).</p> |

9.5 Noise Limiters

Electronic noise limiters will be required on sound systems serving all event spaces to ensure maximum music noise limits (advised herein) are adhered to.

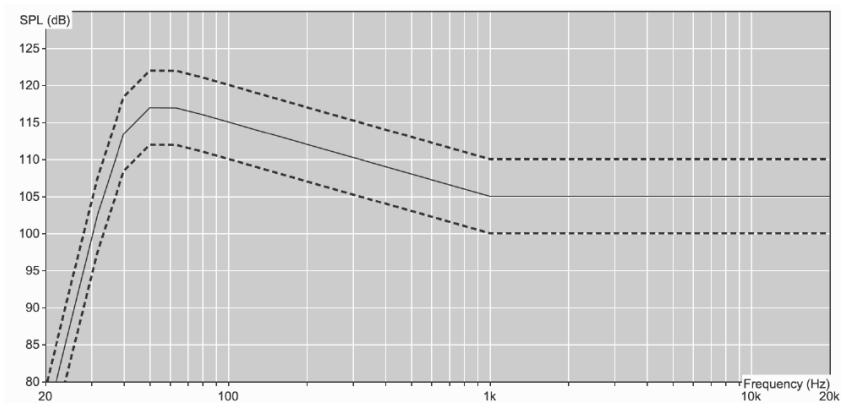
It is understood the venue already has noise limiters on the audio systems in Leno Ex Machina and the Beer Hall. These units were introduced and commissioning as part of the temporary planning consent. To address surveyed exceedances of the original limits, the noise limiters shall be investigated and re-commissioned to the new noise limits presented in this Report.

The limiters at the venue are understood to be the DATEQ SPL-6 unit, pictured below, which are the premium noise limiter on the market. This model allows for noise limits to be set per octave band centre frequency and compresses/limits the audio signal without unduly distorting sound output.



DATEQ SPL-6 Noise Limiter

When setting up the noise limiters, consideration should be given to ‘ideal’ frequency spectra for pleasant sounding music, as outlined in L’Acoustics (as below).



L’Acoustics desired target curve with upper and lower bounds

The relationship is such that sound in the 63 Hz octave band should be dominant. This frequency band typically contains all of the bass-beat energy of modern music. When setting up the noise limiter, it may be prudent to calibrate the 63 Hz octave band first and then bring remaining band frequencies up to a level that produces a pleasant sound, albeit without exceeding respective noise limits at upper frequencies. It would be sensible for the venue to instruct an Audio Consultant to assist in the set up and calibration of all limiters.

Note that whilst the noise modelling and assessment work presented herein has been undertaken with as much accuracy as is feasibly possible, there will inevitably be some degree of uncertainty in the noise limits advised herein which cannot be easily quantified.

For this reason, the Local Authority may wish to introduce a condition of planning that ensures that any current issues with the noise limiters are investigated and that the limiters are re-commissioned once venue acoustic treatment works are complete. This study will allow for *actual* music noise limits to be determined through acoustic testing of the venue, which can be used to calibrate the noise limiters. The final report shall demonstrate to the Local Authority that these final noise limits ensure resultant noise breakout levels comply with the limits presented in Section 7.0.

## 9.6 Loudspeaker Arrays (Recommendations Only)

In any venue space subject to noise limits, it is often sensible to consider the use of many smaller loudspeakers evenly distributed around the event space, as opposed to large loudspeaker stacks in one specific location. Distributing the sound through an array of satellite loudspeakers can ensure an even sound coverage across the space. Otherwise, there may be 'hot spots' close to the loudspeakers which may unduly influence settings on the noise limiter, resulting in much quieter audio levels elsewhere in the room.

We would also recommend any loudspeakers that are fixed at high level to the lightweight roofing members have resilient fixing details to prevent structure-borne noise transfer.

## 10.0 Music Noise Breakout Assessment

### 10.1 Noise Model

In order to analyse music noise breakout levels at surrounding noise sensitive receptors, a noise model of the site and its surroundings has been created. The model shall be used to evaluate combined music noise output from all event spaces operating simultaneously, as well as the kitchen/dining area, as follows:

- Leno Ex Machina,
- Beer Hall,
- Night Market,
- Event Space A (former storeroom),
- Event Space B,
- Kitchen/dining.

In circulation spaces, including fire escape corridors, BOH spaces and offices, noise spill from adjoining events areas has been calculated to determine resultant internal reverberation noise levels in these areas so that contributions from their respective radiating façades/roofs are included in the model.

The complete building envelope (roofs, external walls, doors) has been modelled as a matrix of radiating point sources, each calibrated to correspond to the reverberation noise level in each respective room and with the sound reduction applied for the façade/roof construction at each respective point source.

For the roof (the most critical noise breakout path), low frequency sound reduction performance figures have been determined by the model and calibrated using the survey results at Position 3 and 4 (ref Section 5.0). Where survey readings were background limited (typically at frequencies above 500 Hz) sound reduction figures for the roof have been applied based on published test data for equivalent roof constructions, e.g. by Corus, and Insul Sound Insulation Prediction Software, but with flanking limitations applied to obtain realistic 'apparent' (i.e. on-site) sound reduction figures.

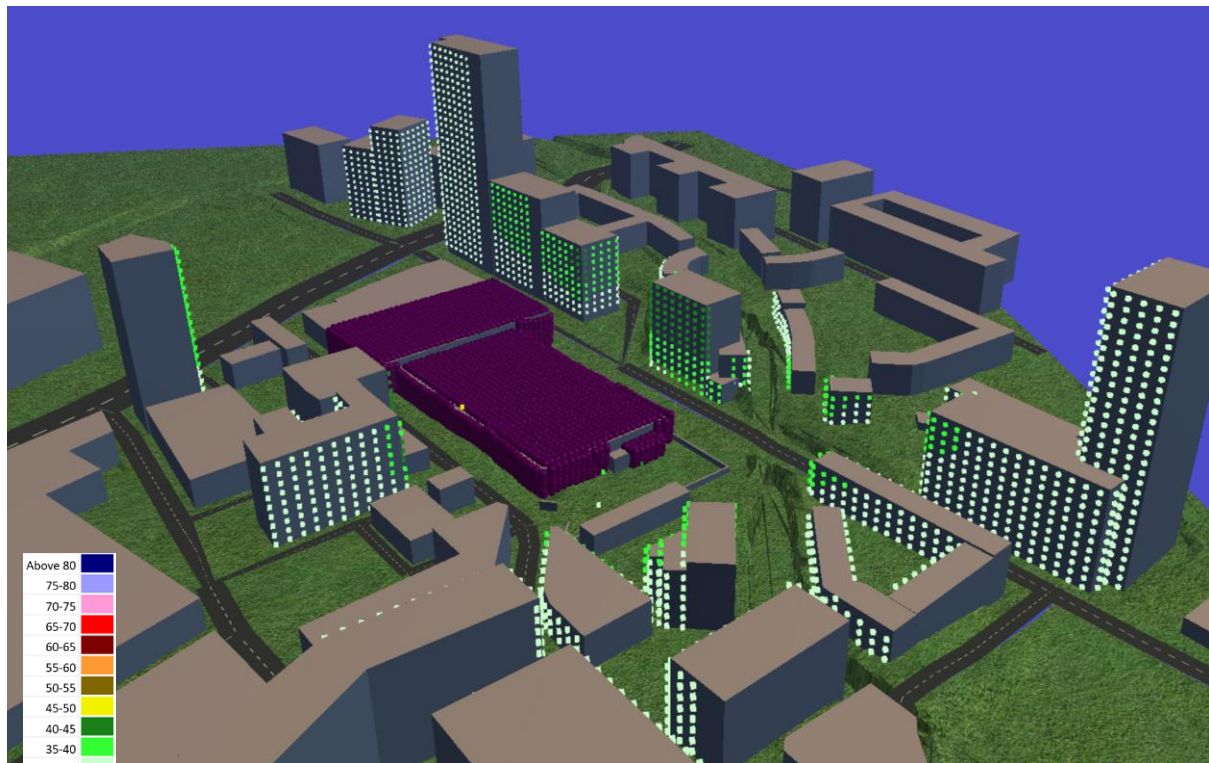
All 'apparent' sound reduction performance figures used in our analysis, for both room-to-room noise spill calculations and façade/roof losses, are tabulated in Appendix D. Room-to-room noise spill calculations follow industry standard equations and composite sound reduction performance for separating elements containing more than one type of construction (e.g. a wall with a door).

The software, NoiseMap Five, adopts ISO-9613:1996 methods for atmospheric sound radiation and barrier attenuation. All buildings are modelled as reflective with a 0.0 absorption coefficient. The calculation to determine radiating sound power levels for individual point sources is taken from BS 12354-4: 2000 as below:

$$L_w = L_p(int) + C_d - R' + 10 \times \log_{10}\left(\frac{S}{S_o}\right)$$

, where  $L_w$  is the sound power per point source,  $L_p(int)$  is the internal sound pressure level,  $C_d$  is the diffusivity term (typically -5 or -6 dB for diffuse fields and reflecting walls depending on room size),  $S$  is the radiated surface area of each 'segment' and  $S_o$  is the reference radiating area, 1 m<sup>2</sup>.

A 3D view extracted from the noise model is presented below.



Noise model showing 3D view of site & surroundings with coloured receptors showing resultant incident free-field  $L_{Aeq,5min}$  noise levels (NB: This shows the resultant levels with venue acoustic treatment applied and noise limits assigned)

## 10.2 Noise Sensitive Receptors

Music noise breakout levels have been assessed to the nearest and most exposed residential windows of the following receptor buildings (ref. Section 2.3):

- Laystall St Apartments: consented scheme on the corner of Gt Ancoats St to the north,
- Ducie St Apartments: consented scheme in construction to the north,
- Junction Works: existing apartments on Ducie St to the west,
- Paradise Wharf: existing apartments to the south west,
- Jutland St Apartments: existing apartments off Wharf Close to the south west,
- Store St Apartments: consented scheme in construction to the south,
- Oxygen: existing apartment to the east.

## 11.0 Permissible Internal Music Noise Levels

With all additional event spaces added, and with consideration for the venue acoustic treatment set out in Section 8.0, the following tables present the maximum permissible internal music noise levels in each event space during daytime and night-time periods.

The approach taken has been to try and maximise permitted noise levels in the live/main event spaces, namely Leno Ex Machina and the Beer Hall. The permitted noise levels in other spaces (e.g. Night Market) are compromised as a result. The levels could be rebalanced to permit higher levels in other spaces but this may unduly restrict music noise levels in the live/main event spaces.

A balance between all spaces can be determined and calibrated through pre-operation acoustic commissioning testing, coinciding with the calibrating of sound system noise limiters.

Much greater levels of music noise will be permissible in Event Space B, as this space has no direct external building fabric elements. Noise spill to adjoining spaces (namely the Night Market) will be controlled with masonry constructions and acoustic lobbies.

## Daytime Operation (<23:00hr)

| Space           | Maximum permissible internal music noise levels, $L_{eq,5min}$ (dB) at OBCF (Hz) |     |     |     |     |     |     |
|-----------------|----------------------------------------------------------------------------------|-----|-----|-----|-----|-----|-----|
|                 | 63                                                                               | 125 | 250 | 500 | 1k  | 2k  | 4k  |
| Leno Ex Machina | 86                                                                               | 83  | 83  | 86  | 86  | 86  | 82  |
| Beer Hall       | 81                                                                               | 78  | 82  | 86  | 86  | 86  | 80  |
| Night Market    | 78                                                                               | 75  | 74  | 78  | 80  | 80  | 75  |
| Event Space A   | 77                                                                               | 72  | 70  | 75  | 75  | 75  | 72  |
| Event Space B   | 110                                                                              | 110 | 105 | 105 | 105 | 100 | 100 |

## Night-time Operation (>23:00hr)

| Space           | Maximum permissible internal music noise levels, $L_{eq,5min}$ (dB) at OBCF (Hz) |     |     |     |     |     |     |
|-----------------|----------------------------------------------------------------------------------|-----|-----|-----|-----|-----|-----|
|                 | 63                                                                               | 125 | 250 | 500 | 1k  | 2k  | 4k  |
| Leno Ex Machina | 80                                                                               | 78  | 77  | 80  | 80  | 80  | 76  |
| Beer Hall       | 76                                                                               | 74  | 75  | 77  | 80  | 80  | 74  |
| Night Market    | 71                                                                               | 69  | 70  | 74  | 74  | 74  | 67  |
| Event Space A   | 70                                                                               | 67  | 69  | 72  | 72  | 70  | 63  |
| Event Space B   | 105                                                                              | 105 | 105 | 105 | 105 | 100 | 100 |

## 12.0 Noise Management Plan

We understand there is a noise management plan already in place for the venue, which details measures to minimise noise impacts from patrons exiting the venue late at night. We would advise this plan is reviewed, for which we propose the following best practice measures:

- No amplified music to be played in any external outside space.
- High levels of amplified music inside the venue not to be played beyond agreed venue opening hours.
- Security staff shall be positioned at site exit points to warn patrons that anti-social behaviour (including shouting) is unacceptable. Those who do not oblige should be asked to leave the area.

- Signs should be introduced within the building near to exit doors asking patrons to respect the neighbours and keep noise to a minimum as they leave.
- Bottles and bins to be emptied away from residential homes and during social daytime hours only.
- Noise breakout from kitchens and other back of house spaces to be minimised by ensuring external doors are kept closed during operation.
- Noise limiters will be in use where necessary. The noise limiters will be locked to prevent third-party performing arts (and/or their sound engineers) from disabling the devices.
- The venue shall implement a robust complaints protocol. Any resident wishing to raise a noise complaint should be able to do so easily with the venue's management team. The management team should investigate any complaint immediately and seek to implement measure to resolve the issue swiftly without involving the Local Authority. A record of complaints should be kept, along with notes on measures implemented to resolve the problem and prevent future issues.

## 13.0 Conclusions

Full planning permission is sought for the operation of Diecast, an entertainment venue on Ducie Street in Manchester. The venue is currently operating under temporary planning permission which expires later this year.

The key acoustic issue arising from the operation of the venue is entertainment noise breakout from a number of internal event spaces. This forms the primary focus of this report, although guidance is also provided on plant noise emissions and best practice means for the noise management plan (including noise from patrons entering/exiting the venue). Note, a separate Crowd Management Plan shall be submitted as part of this application.

In order to control music noise breakout levels to satisfy the limits, a detail strategy for the acoustic treatment of the venue has been set out, and maximum permissible internal music noise limits have been assigned for each event space.

To ensure the limits are adhered to, electronic noise limiters shall be used. The limiters shall be set and calibrated through a process of pre-operation acoustic commissioning testing. The Local Authority may wish to secure this through a suitably worded condition of planning.

## Appendix A – Acoustic Terminology

|                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>dB</b>                     | Decibel - Used as a measurement of sound level. Decibels are not an absolute unit of measurement but an expression of ratio between two quantities expressed in logarithmic form.                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>dB(A)</b>                  | The human ear is more susceptible to mid-frequency noise than the high and low frequencies. The 'A'-weighting scale approximates this response and allows sound levels to be expressed as an overall single figure value in dBA. The <sub>A</sub> subscript is applied to an acoustical parameter to indicate the stated noise level is A-weighted (e.g. $L_{Aeq,T}$ in dB). Noise levels in dBA do not have a linear relationship to each other; for similar noises, a change in noise level of 10dBA represents a doubling or halving of subjective loudness. A change of 3dBA is only just perceptible. |
| <b><math>L_{Aeq,T}</math></b> | $L_{Aeq,T}$ is the equivalent continuous sound pressure level. It is an average of the total sound energy measured over a specified time measurement period, $T$ .                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b><math>L_{10,T}</math></b>  | $L_{10}$ is the noise level exceeded for 10% of the measurement period $T$ (i.e. the quietest 10% of the measurement) and has, for many years, been used in the assessment of road traffic noise.                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b><math>L_{90,T}</math></b>  | $L_{90}$ is the noise level exceeded for 90% of the measurement period $T$ (i.e. the quietest 10% of the measurement) and is often used to describe the 'background' noise level.                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b><math>L_{max}</math></b>   | $L_{max}$ is the maximum sound pressure level recorded over the measurement period, $T$ . $L_{max}$ is often used in assessing scheduled environmental noise 'events' (such as train passbys), particularly at night where such events may cause sleep disturbance.                                                                                                                                                                                                                                                                                                                                        |
| <b><math>R_w</math></b>       | The weighted sound reduction index, $R_w$ , is a single figure description of sound reduction as defined in BS EN ISO 717-1. It is single-number quantity which characterizes the airborne sound insulating properties of a material or building element over a range of frequencies. The $R_w$ is calculated from sound insulation measurements taken in an acoustic laboratory. Sound insulation ratings derived from site measurements are invariably lower than the laboratory figures and are referred to as the apparent weighted sound reduction index, $R'_w$ .                                    |
| <b><math>D_{n,e,w}</math></b> | The weighted element-normalised level difference, $D_{n,e,w}$ , is a single figure description of the sound insulation performance of small building elements, such as a trickle ventilator.                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b><math>C_{tr}</math></b>    | $C_{tr}$ is correction term applied against the sound insulation single-number values (e.g. $R_w$ ) to provide a weighting against low frequency performance. The reference values used within the $C_{tr}$ calculation are based on urban traffic noise.                                                                                                                                                                                                                                                                                                                                                  |

## Appendix B – Planning Policy & Assessment Guides

### Planning Policy

- **Noise Policy Statement for England (NPSE)**

The Noise Policy Statement for England (NPSE) launched in March 2010 states the long-term vision of Government noise policy is to “*promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development*”.

The long-term vision is supported by the following aims; 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;
- Where possible, contribute to the improvement of health and quality of life.

The intention is that the NPSE should apply to all types of noise apart from noise in the workplace (occupational noise).

The NPSE introduces a three-tier concept for the assessment of noise impacts onto a receptor:

- **NOEL – No Observed Effect Level:** The level below which no effect can be detected and below which there is no detectable effect on health and quality of life due to noise.
- **LOAEL – Lowest Observable Adverse Effect Level:** The level above which adverse effects on health and quality of life can be detected.
- **SOAEL – Significant Observed Adverse Effect Level:** The level above which significant adverse effects on health and quality of life occur.

There are no numeric thresholds relating to each of the above. The NPSE acknowledges that the severity of noise impacts vary depending upon the type of noise, the type of receptor, the duration (on-time) of the noise, the characteristics of the noise, the time of day, the day of the week, etc.. As a result, the definition of what constitutes an SOAEL is somewhat flexible.

- **National Planning Policy Framework (NPPF)**

The National Planning Policy Framework (NPPF) was first published in 2012 and sets out the government’s planning policies for England and how these are expected to be applied.

The latest revision of the NPPF (December 2024) states that planning system should **contribute to, and enhance**, the natural and local environment by (amongst others) “*preventing both new and existing*

*development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, water or **noise pollution** or land stability.”*

The express inclusion of noise in the NPPF means that it is a material planning consideration for local planning decisions.

Paragraph 123 of the NPPF document states that planning policies and decisions should aim to:

*“A. Avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;*

*B. Mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions;*

*C. Recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established; and*

*D. Identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.”*

NPPF advises that decisions relating to planning applications should ensure “...new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development.”

To achieve this, new developments should “mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life” and should also “identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.”

The NPPF recognises 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 on Noise (PPG)**

The National Planning Practice Guidance (PPG) is a web-based resource, launched by the Department for Communities and Local Government (DCLG) in March 2014 to support the NPPF and make it more accessible. It advises on how planning can manage potential noise impacts in new development. The guidance is regularly reviewed and updated and noise is listed as a specific category. The guidance is for ad hoc developments, as major infrastructure is covered by overarching National Policy Statements.

PPG provides the following tabulated summary of the effects of noise exposure (in terms of health and quality of life) associated with noise generating and sensitive developments.

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

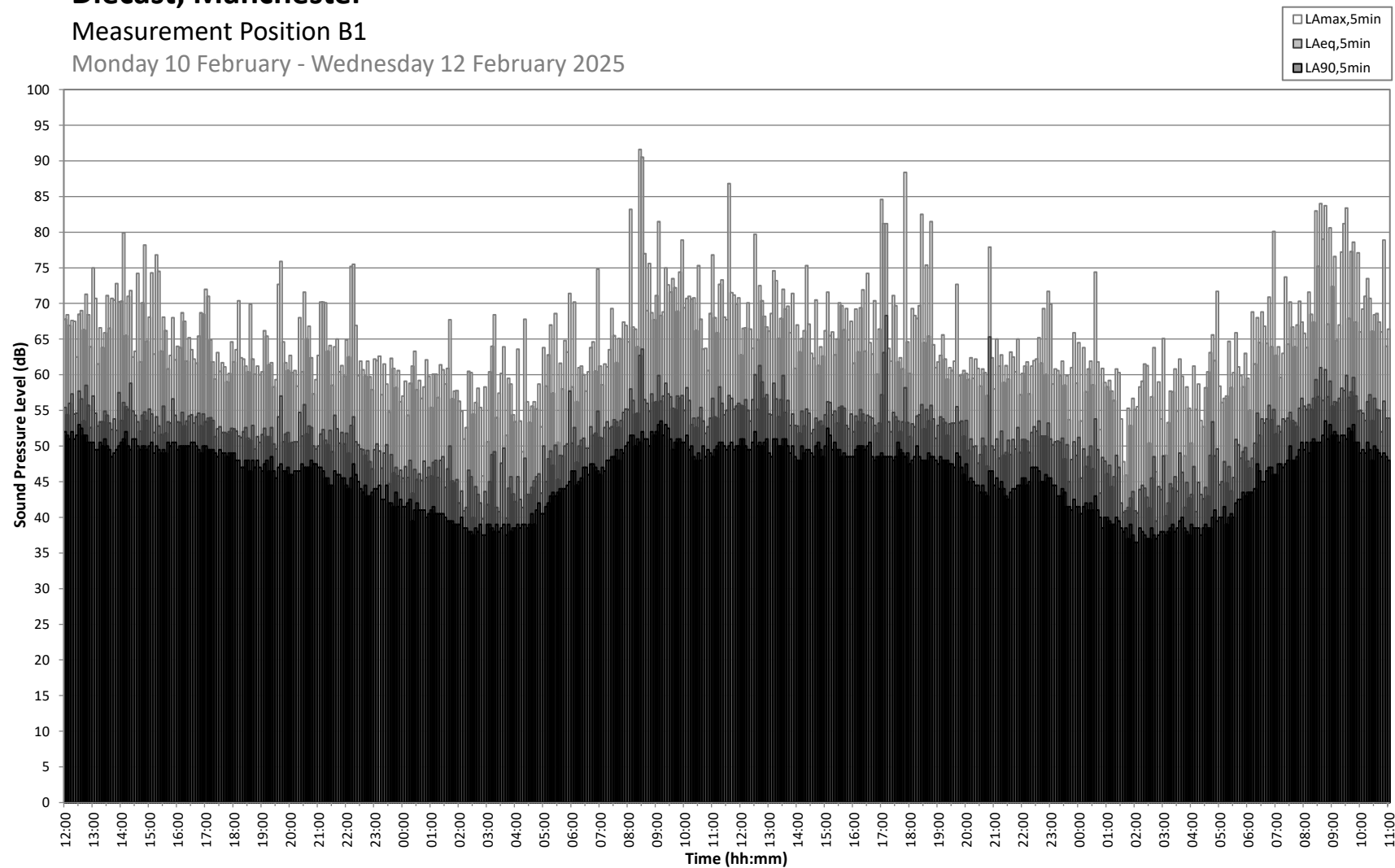
## **Appendix C – Baseline (Background) Noise Survey Time History Graphs**

## Diecast, Manchester

Measurement Position B1

Monday 10 February - Wednesday 12 February 2025

**22198-B1**

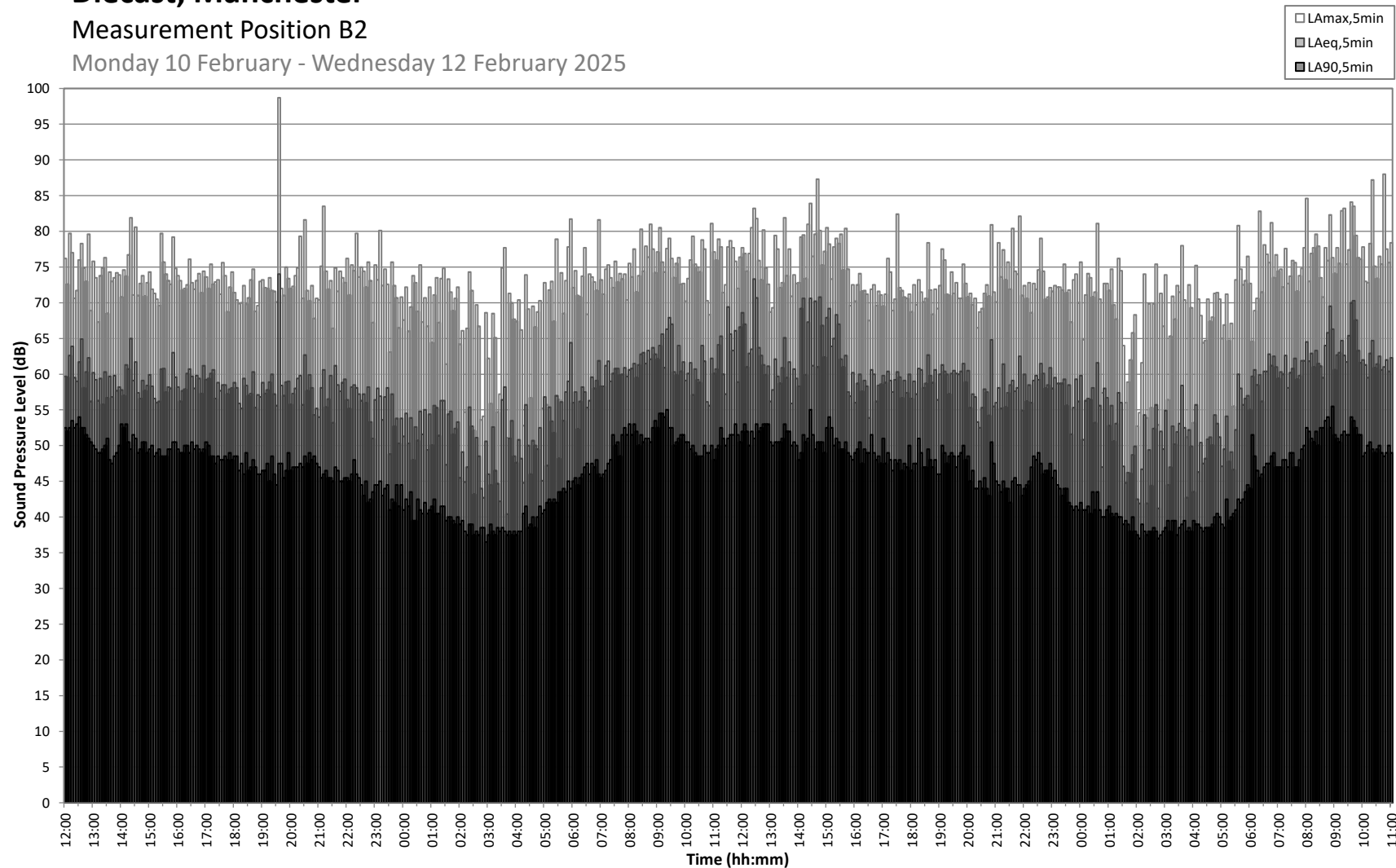


## Diecast, Manchester

Measurement Position B2

Monday 10 February - Wednesday 12 February 2025

22198-B2



## Appendix D – Apparent Sound Reduction Indices for Various Building Fabric Elements

| Element                                                                                                       | Apparent Sound Reduction, $R'$ (dB) at OBCF (Hz) |     |     |     |    |    |    |
|---------------------------------------------------------------------------------------------------------------|--------------------------------------------------|-----|-----|-----|----|----|----|
|                                                                                                               | 63                                               | 125 | 250 | 500 | 1k | 2k | 4k |
| Southern warehouse roof                                                                                       | 14                                               | 21  | 27  | 30  | 37 | 38 | 42 |
| Northern warehouse roof (as proposed)                                                                         | 12                                               | 18  | 25  | 32  | 37 | 40 | 44 |
| 140 mm blockwork                                                                                              | 25                                               | 30  | 33  | 37  | 40 | 43 | 45 |
| 300 mm Solid brick external wall                                                                              | 33                                               | 35  | 37  | 39  | 43 | 48 | 52 |
| Insulated clad external wall, 0.7 mm steel / 100mm insulated cavity / 0.7 mm steel                            | 12                                               | 15  | 18  | 23  | 27 | 30 | 35 |
| Lined insulated clad external wall, as above + 200 mm cavity / 100 mm mineral wool / 15 mm dense plasterboard | 18                                               | 22  | 26  | 31  | 37 | 41 | 47 |
| Glazing to Leno outer lobby (conventional DGU)                                                                | 16                                               | 18  | 18  | 21  | 23 | 26 | 28 |
| External fire exit door (solid core timber, fire/draught seals)                                               | 14                                               | 16  | 19  | 22  | 23 | 26 | 26 |
| Lobby partition, 2x15mm SoundBloc, stud, mineral wool                                                         | 15                                               | 25  | 35  | 42  | 50 | 50 | 50 |
| Lobby lid, cemboard, 100 mm joist, mineral wool, 2x15mm SoundBloc                                             | 13                                               | 22  | 32  | 40  | 48 | 50 | 50 |
| Twin stud partition, 2x15mm SoundBloc, stud, mineral wool                                                     | 20                                               | 33  | 40  | 47  | 50 | 50 | 50 |
| Insulated clad internal wall, 0.7 mm steel / 100mm insulated cavity / 0.7 mm steel                            | 12                                               | 15  | 18  | 23  | 27 | 30 | 35 |
| Concrete floor to office over Event Space B (150mm)                                                           | 33                                               | 37  | 40  | 47  | 53 | 55 | 55 |
| Internal door, solid core timber, tight fitting, no seals                                                     | 14                                               | 16  | 19  | 22  | 24 | 26 | 26 |
| 35 dB $R_w$ acoustic door set, metal or timber                                                                | 22                                               | 22  | 33  | 35  | 35 | 38 | 38 |