

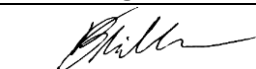

Protein Studios, New Inn Yard

Noise Management Plan

Protein Studios Shoreditch Ltd

Revision 0

25 November 2022

| Role | Name | Position | Signature | Date |
|----------|----------------------------------|----------|--|------------|
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1 Introduction

1.1 Appointment

- 1.1.1 F1 Acoustics Company Limited (F1AC) has been appointed by Protein Studios Shoreditch Ltd (PSS) to provide a noise management plan (NMP) for Protein Studios, 31 New Inn Yard, London, EC2A 3EY.
- 1.1.2 This NMP contains details of the noise management strategies that will be executed to ensure that the objectives of the Licencing Act 2003 relating to public nuisance and music noise are addressed and implemented at all times during events.
- 1.1.3 This NMP is a “live document” and will be updated alongside the overall event management plans as it is developed based on feedback from events and local residents.

1.2 About F1 Acoustics Company Limited

- 1.2.1 F1AC are specialists in venue, event and festival sound control and have provided services for venues including Victoria Warehouse (Manchester) and Printworks (London); and festivals including Glastonbury, Boomtown, Southwest Four, Leeds, Latitude and GALA Festival plus numerous other single stage and multi-stage events across the UK. We have a combined experience of over 26 years providing high quality sound management services and all of our Consultants are Members of the Institute of Acoustics. As well as entertainment sound control the company deals with a range of environmental, planning and licencing acoustics and noise projects. Our staff have presented expert testimony at planning and licencing hearings as well as being accustomed to liaising with Local Authority Officers regarding noise.
- 1.2.2 F1AC has used National Guidelines, The Code of Practice on Environmental Noise Control at Concerts (The Noise Council, 1995) and our expert experience in this sector to tailor this Noise Management Plan for the type of events; number of attendees; different studio spaces in use; and location and context to ensure an achievable sound management protocol is established.

2 Protein Studios

2.1 Overview

- 2.1.1 Protein Studios have five interconnected, white box, ground floor studios available for hire. Totalling over 1,250 m², the studios have 5 m to 8.5 m high ceilings, and are located in the heart of the Shoreditch Triangle.

2.2 Location

- 2.2.1 Protein Studios are located off New Inn Yard, Shoreditch, London. The studios are bounded by New Inn Yard to the south, Anning Street to the East, a car park and Bateman's Row to the north and an overground railway on a viaduct between Hoxton and Shoreditch High Street to the west.
- 2.2.2 The nearest noise sensitive premises are located to the south on the opposite side of New Inn Yard and to the north on the upper floors of the building on the opposite side of Bateman's Row.
- 2.2.3 The location of the studios and nearest noise sensitive premises are shown in Figure 1.

2.3 Uses

- 2.3.1 Studio 1 is currently set-up as a café and is open to the public. Studios 2 to 5 are available to hire. The layout of the studios is presented in Figure 2.
- 2.3.2 The studios are rented by various companies and organisations for a multitude of uses. An example of some of the previous uses include exhibitions, product launches, brand activations, pop-up retail, record label showcases, conferences and fashion shows. Inevitably some uses will involve music being played or performed to varying sound levels depending on the importance of the music to the use and whether it is a playlist, a DJ or live performance.
- 2.3.3 The risk of music noise from different uses becoming a disturbance to local noise sensitive residents can be categorised as low, medium and high:
- Low – No music or background music only from a playlist (no DJ). The sound system is home hi-fi sized only (no larger than 200 W RMS).

- Medium – Music is a secondary element to the use of the studio to create an ambience and may be from a playlist or DJ through a sound system that is larger than 200 W RMS.
- High – Music is a primary focus of the use of the studio from a playlist or DJ; or contains any live performance (PA or full band).

3 Music Noise Level Limits

3.1 Code of Practice on Environmental Noise Control at Concerts

- 3.1.1 The Code of Practice on Environmental Noise Control at Concerts contains the following relevant guidance regarding the off-site noise limits at the nearest noise sensitive premises for events where music is a significant element:

“3.1 The music noise levels (MNL) when assessed at the prediction stage or measured during sound checks or concerts should not exceed the guidelines shown in Table 1 at 1 metre from the façade of any noise sensitive premises for events held between the hours of 09.00 and 23.00.

Table 1

| Concert days per calendar year, per venue | Venue category | Guideline |
|--|------------------------------|--|
| 1 to 3 | Urban Stadia or Arenas | The MNL should not exceed 75 dB(A) over a 15 minute period |
| 1 to 3 | Other Urban and Rural Venues | The MNL should not exceed 65 dB(A) over a 15 minute period |
| 4 to 12 | All Venues | The MNL should not exceed the background noise level by more than 15 dB(A) over a 15 minute period |

Notes to Table 1

- 1. The value used should be the arithmetic average of the hourly LA90 measured over the last four hours of the proposed music event or over the entire period of the proposed music event if scheduled to last for less than four hours.*
- 2. There are many other issues which affect the acceptability of proposed concerts. This code is designed to address the environmental noise issue alone.*
- 3. In locations where individuals may be affected by more than one venue, the impact of all the events should be considered.*

4. For those venues where more than three events per calendar year are expected, the frequency and scheduling of the events will affect the level of disturbance. In particular, additional discharges can arise if events occur on more than three consecutive days without a reduction in the permitted MNL.

5. For indoor venues used for up to about 30 events per calendar year an MNL not exceeding the background noise by more than 5 dB(A) over a fifteen minute period is recommended for events finishing no later than 23.00 hours.

6. Account should be taken of the noise impact of other events at a venue. It may be appropriate to reduce the permitted noise from a concert if the other events are noisy.

7. For venues where just one event has been held on one day in any one year, it has been found possible to adopt a higher limit value without causing an unacceptable level of disturbance.

3.2 For events continuing or held between the hours 23.00 and 09.00 the music noise should not be audible within noise-sensitive premises with windows open in a typical manner for ventilation.

Notes on Guidelines 3.2

1. The use of inaudibility as a guideline is not universally accepted as an appropriate method of control. References 6 & 7 (Appendix 1) set out the various issues. This guideline is proposed as there is insufficient evidence available to give more precise guidance.

2. Control can be exercised in this situation by limiting the music noise so that it is just audible outside the noise sensitive premises. When that is achieved it can be assumed that the music noise is not audible inside the noise sensitive premises.

3.3 The nature of music events means that these guidelines are best used in the setting of limits prior to the event (see 4.0).

3.4 Assessment of noise in terms of dB(A) is very convenient but it can underestimate the intrusiveness of low frequency noise. Furthermore, low frequency noise can be very noticeable indoors. Thus, even if the dB(A) guideline is being met, unreasonable disturbance may be occurring because of the low frequency noise. With certain types of events, therefore, it may be necessary to

set an additional criterion in terms of low frequency noise, or apply additional control conditions.

Notes to Guideline 3.4

1. It has been found that it is the frequency imbalance which causes disturbance. Consequently there is less of a problem from the low frequency content of the music noise near to an open air venue than further away.

2. Although no precise guidance is available the following may be found helpful (Ref.8): A level up to 70 dB in either of the 63 Hz or 125 Hz octave frequency band is satisfactory; a level of 80 dB or more in either of those octave frequency bands causes significant disturbance.

3.5 Complaints may occur simply because people some distance from the event can hear it and that, consequently, they feel the music must be loud even though the guidelines are being met. In fact topographical and climatic conditions can be such that the MNL is lower at locations nearer to the venue.”

3.2 Baseline Noise Survey and Sound Propagation Tests

- 3.2.1 A baseline noise survey and sound propagation tests to establish the existing ambient and background sound levels and sound insulation of the studios was undertaken on the evening of Wednesday 5th October 2022, a day without any other activity in the studios occurring. Two locations were surveyed, in front of the studios building on New Inn Yard and at the rear of the car park adjacent to Bateman’s Row.
- 3.2.2 A technical memo outlining the survey methodology and results is included as Appendix B.
- 3.2.3 The results of the baseline noise survey show that the average background sound levels were measured to be $L_{A90,15min}$ 53 dB (between 18:00 to 18:45 and 19:30 to 22:30) at 1.5 m above ground level on New Inn Yard; and $L_{A90,15min}$ 51 dB (between 17:45 to 22:45) at the rear of the car park adjacent to Bateman’s Row at 5 m above ground level. These measured sound levels are considered representative of the background sound level up to 23:00.

3.3 Proposed External Music Noise Level Limits

- 3.3.1 The national guidance document “Code of Practice on Environmental Noise Control at Concerts”, although withdrawn by the Chartered Institute of Environmental Health (CIEH) in 2019 is still the most up to date guidance document available and is still often used in establishing the music noise levels (MNL) for events.
- 3.3.2 In line with the guidance, it may be suitable for the Protein Studios to have up to 30 days of medium risk uses and up to 12 days of high risk uses (depending on frequency and number of medium vs high risk events, i.e. more high risk events may require less medium risk events) per year. The proposed MNL is based on events finishing no later than 23:00. It is proposed to adopt the following MNL limits for low, medium and high risk events:
- Low – Music just audible outside occasionally, should usually be inaudible.
 - Medium – MNL outside a noise sensitive premises should not exceed the background noise by more than 5 dB(A) over a fifteen minute period up to 23:00 (New Inn Yard: $L_{Aeq,15min}$ 58 dB; Bateman’s Row: $L_{Aeq,15min}$ 56 dB).
 - High – MNL outside a noise sensitive premises should not exceed the background noise by more than 15 dB(A) over a fifteen minute period up to 23:00 (New Inn Yard: $L_{Aeq,15min}$ 68 dB; Bateman’s Row: $L_{Aeq,15min}$ 66 dB).

3.4 Proposed Studio Internal Music Noise Level Limits

- 3.4.1 Based on the sound propagation tests the measured broadband A-weighted sound reduction between the studios and the external monitoring points from the studios was:
- Studio 2 & 3 (New Inn Yard): 4 dB(A)
 - Studio 4 (New Inn Yard): 20 dB(A)
 - Studio 4 (Bateman’s Row): 25 dB(A)
 - Studio 5 (Bateman’s Row): 16 dB(A)
- 3.4.2 Therefore, the maximum music noise level in the audience areas for each studio should be controlled to the following sound levels to ensure the proposed external MNL limits are achieved:

Medium Risk Uses

- Studio 2 & 3: $L_{Aeq,15min}$ 62 dB
- Studio 4: $L_{Aeq,15min}$ 78 dB
- Studio 5: $L_{Aeq,15min}$ 74 dB

High Risk Uses

- Studio 2 & 3: $L_{Aeq,15min}$ 72 dB
- Studio 4: $L_{Aeq,15min}$ 88 dB
- Studio 5: $L_{Aeq,15min}$ 84 dB

- 3.4.3 Timings of events may be considered to allow music noise levels greater than those given above for afternoon events not going beyond 19:00.

4 Music Noise Monitoring and Control Strategy

4.1 Low Risk Uses

4.1.1 For low risk events where a small sound system is used (< 200 W RMS) for background music from a playlist it is unlikely that music noise will be audible outside the studios if all windows and doors remain closed.

4.1.2 A check will be made by a representative of Protein Studios that the music is normally not audible outside and during the quietest periods of external ambient noise is just audible at most.

4.2 Medium Risk Uses

4.2.1 For medium risk events where music is a secondary element to the use of the studio to create an ambience and may be from a playlist or DJ with a professional sound system (> 200 W RMS) it is likely that the music will be audible externally to the Protein Studios building. However, by restricting the number of uses a year and placing controls on the MNL it will be possible to operate without disturbance to the nearest noise sensitive premises.

4.2.2 Before the start of any event or use of the studios a sound system propagation test will be carried out to set the MNL to the limit inside the studio and a check carried out externally to the building to ensure the external music noise level is appropriate. These checks will be made by a representative of Protein Studios. MNL checks will be made every 1-2 hours throughout a medium risk use of the studios.

4.2.3 In addition to the propagation test and spot checks of the MNL sound level indicators could be installed in each of the studio spaces and calibrated to provide an 'always-on' visual indication of the internal noise level.

4.2.4 It is recommended that a trusted 'house' sound system supplier who understands the studios and the nearest noise sensitive premises is appointed and all studio uses that require a professional sound system are advised to use this supplier.

4.2.5 A suitable sound system for medium risk uses is one single driver sub-woofer (up to 500 W RMS) and one mid/top frequency box (up to 500 W RMS) per side (L&R). However, for

certain uses a more distributed sound system for a more even coverage of a larger area may be more suitable.

4.3 High Risk Uses

- 4.3.1 For high risk events where music is a primary element to the use of the studio from a playlist, DJ or live performance with a professional sound system (> 200 W RMS) it is likely that the music will be audible externally to the Protein Studios building. However, by communicating with local residents in advance, employing a sound control expert and placing controls on the MNL it will be possible to operate without significant disturbance to the nearest noise sensitive premises on a limited number of days a year.
- 4.3.2 For all high risk uses of the studios a bespoke NMP will be required to consider the placement of the stage and sound system, nearest noise sensitive premises and sound control methodology appropriate to the specific use.
- 4.3.3 All high risk uses will be communicated to nearby noise sensitive premises with information on the type of event, timings of the event and a contact telephone number for any enquires before or during the event.
- 4.3.4 It is recommended that a trusted 'house' sound system supplier who understands the studios and the nearest noise sensitive premises is appointed and all studio uses that require a professional sound system are advised to use this supplier.
- 4.3.5 A suitable sound system for high risk uses is one single driver sub-woofer (up to 500 W RMS) and one mid/top frequency box (up to 500 W RMS) per side (L&R). However, for certain uses a more distributed sound system for a more even coverage of a larger area may be more suitable. Specific layouts may be able to support a larger sound system if required.
- 4.3.6 The bespoke NMP and sound control methodology for high risk uses may include:
- A sound control consultant in attendance to focus on monitoring MNL. The sound control consultant will have ultimate operational control over all the sound levels throughout the event. Therefore, all other parties, including artists, production managers, stage managers, sound engineers and event managers will be instructed

not to increase any sound levels unless specifically agreed by the Consultant responsible for sound control.

- Sound propagation tests will be carried out before the start of the event to set the maximum MNL at the stages to comply with the target MNL limits externally.
- The sound level in the studio(s) will be measured continuously during the event and a display showing the current sound level and set limits will be provided for the sound engineer. This will reduce the amount of sound level creep and ensure that the external MNL will remain within the target MNL criteria at the nearest noise sensitive premises.
- The sound system will have appropriate controls for adjusting and fine-tuning individual third octave-bands. A multi-band compressor/limiter or dynamic equaliser will also be used where required to provide greater control of the sound level output. The only people with access to change the settings on the compressors/limiters will be members of the sound engineering team.
- The assessment of the MNL at the noise sensitive premises will include a subjective assessment for any frequency components or featured elements that may cause significant disturbance (including low frequency music noise). In the event that a significant disturbance is identified, appropriate adjustments will be actioned at the relevant stage.
- Should any complaints of noise be received, at any time during the event or sound propagation tests, a consultant from the sound control team will visit the complainant address (or representative location) and take a measurement. If the MNL is measured to be above the target MNL limit immediate action will be taken on-site to reduce the MNL from the event. This will be achieved by two-way radio or mobile communication with all persons involved with the sound control procedures, thus a quick response to the problem can be actioned.
- A noise report will be provided after the event to include a summary of the internal and external MNL measured throughout the event; actions taken as a result of the measurements; complaints received; complaint investigation measurements; and any actions taken as a result of complaint investigation.

5 Other Noise Sources

5.1 Ingress and Egress

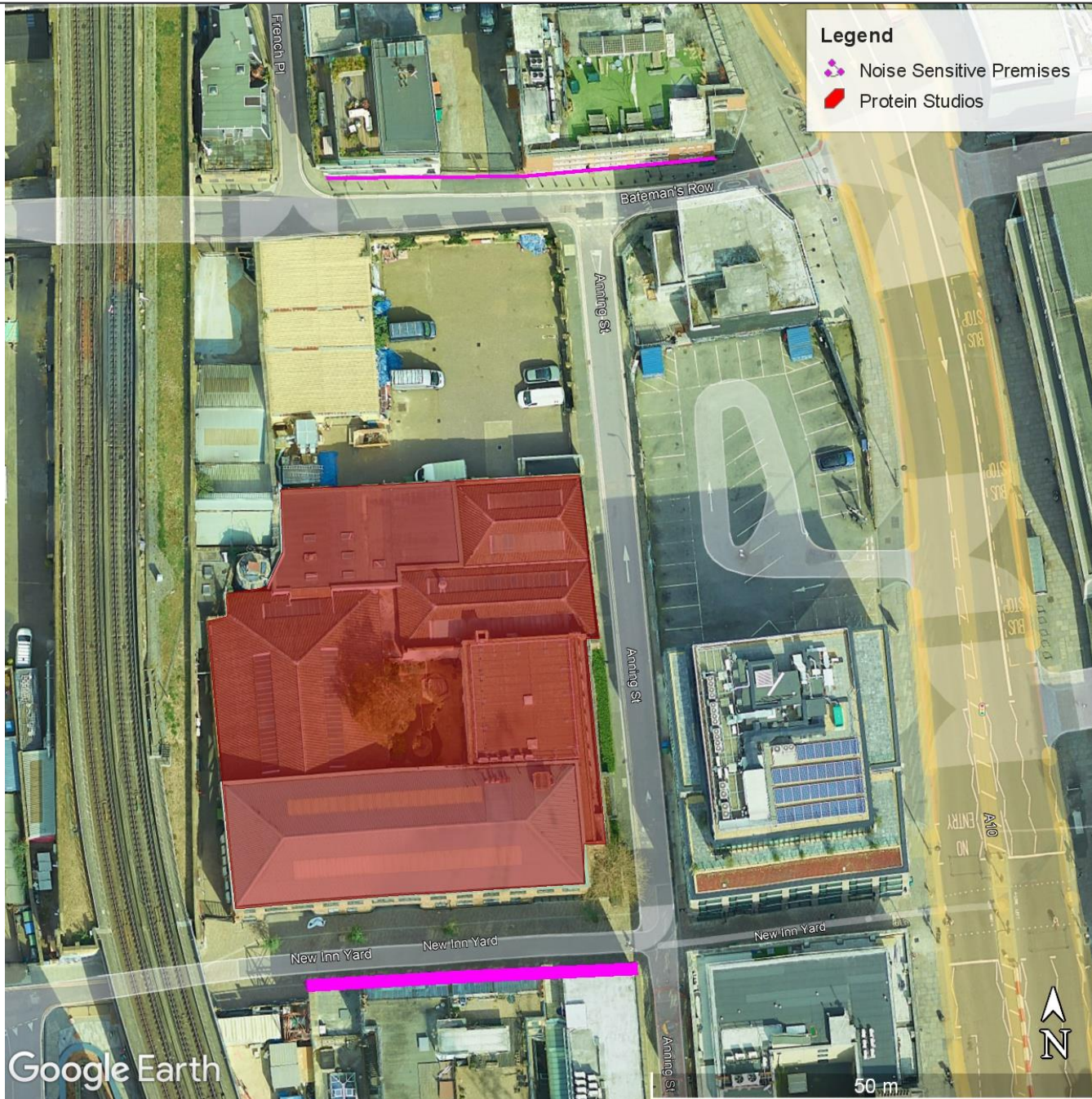
- 5.1.1 Protein Studios may attract large groups for some medium and high risk uses however people are likely to arrive at staggered times. Therefore, people are likely to arrive on their own or in small groups. No specific management of ingress is required. On limited occasion there may be a queue before an event and this will be managed by Protein Studio representatives to ensure it is located, where possible, away from the nearest noise sensitive premises on Anning Street and that attendees are respectful.
- 5.1.2 For most uses there will be a natural staggering of people leaving; therefore, no specific egress noise management is required. However, on limited occasion events may finish and all the attendees will leave at a similar time. To reduce the noise impact of egress on the nearest noise sensitive premises the most appropriate exit(s) should be planned in advance.
- 5.1.3 When necessary, signage will be in place in visible areas next to doors reminding customers to ‘please leave quietly and respect our neighbours’.

5.2 Smoking Area

- 5.2.1 No dedicated smoking area is associated with Protein Studios and it is expected people will smoke out the front and/or side of the building. Customers will not be allowed to take their drinks outside. This will encourage people to spend as little time outside as possible and minimise groups forming.
- 5.2.2 Management and staff will identify any loud customers outside and remind them to be respectful of the neighbours. Signage will be in place in visible areas next to doors reminding customers to ‘please leave quietly and respect our neighbours’.

5.3 Glass Disposal

- 5.3.1 Disposal of glass can be a significantly loud process when internal glass bins are emptied into larger external glass bins. To avoid glass disposal being a significant disturbance to nearby noise sensitive premises glass will only be disposed of externally between the hours of 09:00 and 19:00.



Legend

- Noise Sensitive Premises
- Protein Studios

| REV | DATE | D | R | DESCRIPTION |
|-----|------------|----|----|-------------|
| 0 | 25/11/2022 | RM | RB | Issue |

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| PROJECT: | Protein Studios – Noise Management Plan |
| CLIENT: | Protein Studios Shoreditch Ltd |
| TITLE: | Location and Nearest Noise Sensitive Premises |
| DATE: | 25/11/2022 |
| REVISION: | 0 |
| SCALE: | Scale as shown. |
| DRAWING NO: | 1739/ProteinStudiosNMP/1/0 |
| FIGURE NO: | 1 |
| DRAWN BY: | Robert Miller |
| REVIEWED BY: | Rupert Burton |

Google Earth



| REV | DATE | D | R | DESCRIPTION |
|-----|------------|----|----|-------------|
| 0 | 25/11/2022 | RM | RB | Issue |

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|--------------|---|
| PROJECT: | Protein Studios – Noise Management Plan |
| CLIENT: | Protein Studios Shoreditch Ltd |
| TITLE: | Studio Layout Plan |
| DATE: | 25/11/2022 |
| REVISION: | 0 |
| SCALE: | Not to scale. |
| DRAWING NO: | 1739/ProteinStudiosNMP/2/0 |
| FIGURE NO: | 2 |
| DRAWN BY: | Robert Miller |
| REVIEWED BY: | Rupert Burton |

Appendices

Glossary of Acoustic Terms

Noise is defined as unwanted sound. The range of audible sound is from 0 dB to 140 dB. The frequency response of the ear is usually taken to be about 18 Hz (number of oscillations per second) to 18,000 Hz. The ear does not respond equally to different frequencies at the same level. It is more sensitive in the mid-frequency range than at the lower and higher frequencies, and because of this, the low and high frequency component of a sound are reduced in importance by applying a weighting (filtering) circuit to the noise measuring instrument. The weighting which is most used and which correlates best with the human subjective response to noise is the A-weighting. This is an internationally accepted standard for noise measurements.

The ear can just distinguish a difference in loudness between two noise sources when there is a 3 dB difference between them. Also when two sound sources of the same noise level are combined the resultant level is 3 dB higher than the single source. When two sounds differ by 10 dB one is said to be twice as loud as the other.

The subjective response to a noise is dependent not only upon the sound pressure level and its frequency, but also its intermittency. Various indices have been developed to try and correlate annoyances with the noise level and its fluctuations. The indices and parameters used in this report are defined below:

- **Background Noise Level** – The prevailing sound level at a location, measured in terms of the $L_{A90,T}$, on an equivalent day and at an equivalent time when no concert or sound checks are taking place.
- **dB(A)** – The A-weighted sound pressure level whereby various frequency components of sound are weighted (equalized) to reflect the way the human ear responds to different frequencies.
- **L_{Aeq}** – The equivalent continuous sound pressure level which at a given location over a given period of time contains the same A-weighted sound pressure level of a steady sound that has the same energy as the fluctuating sound under investigation.
- **$L_{AN,T}$** – The A-weighted sound level exceeded for N% of the measurement period (T).
- **Music Noise Level (MNL)** – The L_{Aeq} of the music noise measured at a particular location.
- **Noise Consultant** – A person given responsibility by the organiser of the event for monitoring noise levels in accordance with the prevailing conditions, and who has the ability and authority to make decisions and implement changes in noise level during the event.

Appendix B

Baseline Noise Survey Technical Memo

TECHNICAL MEMO

| | |
|------------|---|
| Project | Protein Studios – Baseline Noise Survey and Sound Propagation Tests |
| Client | Protein Studios |
| Written by | Robert Miller, Director, F1 Acoustics Company Limited |
| Date | 28 October 2022 |
| Reference | 1739/BaselineTechnicalMemo/Rev0 |

1 INTRODUCTION

F1 Acoustics Company Limited has been appointed by Protein Studios to undertake a baseline noise survey and propagation tests to inform a future noise management plan (NMP) for events that have an element of live or recorded music.

2 BASELINE NOISE SURVEYS

To measure the existing ambient and background sound levels representative of the nearest noise sensitive premises, baseline noise surveys were carried out on the evening of Wednesday 5th October 2022, a day without any other activity in the studios occurring. Two locations were surveyed, in front of the studios building on New Inn Yard and at the rear of the car park adjacent to Bateman's Row, as shown in Figure 2.1.

Figure 2.1: Baseline Noise Survey Locations



The car park rear baseline survey location was mainly unattended with the front baseline survey location taken as an attended measurement. The sound level meters were set to record 15 minute periods of the broadband A-weighted and third octave band unweighted ambient ($L_{eq,15min}$) and background ($L_{90,15min}$) sound levels.

Survey Location 1 – Rear Car Park (Bateman's Row)

The noise survey was located overlooking Bateman's Row at the rear of the car park, representative of the southern facing facades of the nearest noise sensitive premises to the north of Bateman's Row. The noise survey location is shown in Figure 2.1.

The microphone was installed at a height of 5 m above ground level and in a free-field location. The survey was unattended and measurement data was recorded in 15 minute periods for a duration of five hours (17:45 to 22:45).

The noise environment during the baseline noise survey was comprised of distant and local road traffic noise, occasional aircraft and pedestrians.

Survey Location 2 – Front (New Inn Yard)

The noise survey was located on the edge of New Inn Yard road. The noise survey location is shown in Figure 2.1.

The microphone was installed at a height of 1.5 m above ground level and in a free-field location. The survey was attended and measurement data was recorded in 15 minute periods for two measurement sessions with a total duration of three hours 45 minutes (18:00 to 18:45 and 19:30 to 22:30).

The noise environment during the baseline noise survey was comprised of distant and local road traffic noise and pedestrians. At the beginning of the survey up until approximately 20:00 some music was audible from the gym next to Protein Studios.

Equipment and Calibration

The instrumentation used for the noise surveys were Rion NL-52 Class 1 sound level meters (SLM) (Serial numbers: 00420762, 00420761) and a Rion NC-74 Calibrator (34425554).

The SLM had field calibration checks carried out prior to and immediately following the surveys and no significant deviation was recorded. All instrumentation used has been calibrated to traceable standards within two years.

Weather

The meteorological conditions were monitored throughout the duration of the noise survey. There were no periods considered unsuitable for noise monitoring during the survey.

3 BASELINE NOISE SURVEY RESULTS

A summary of the baseline noise survey results is presented in Table 3.1 and Graph 3.1 below.

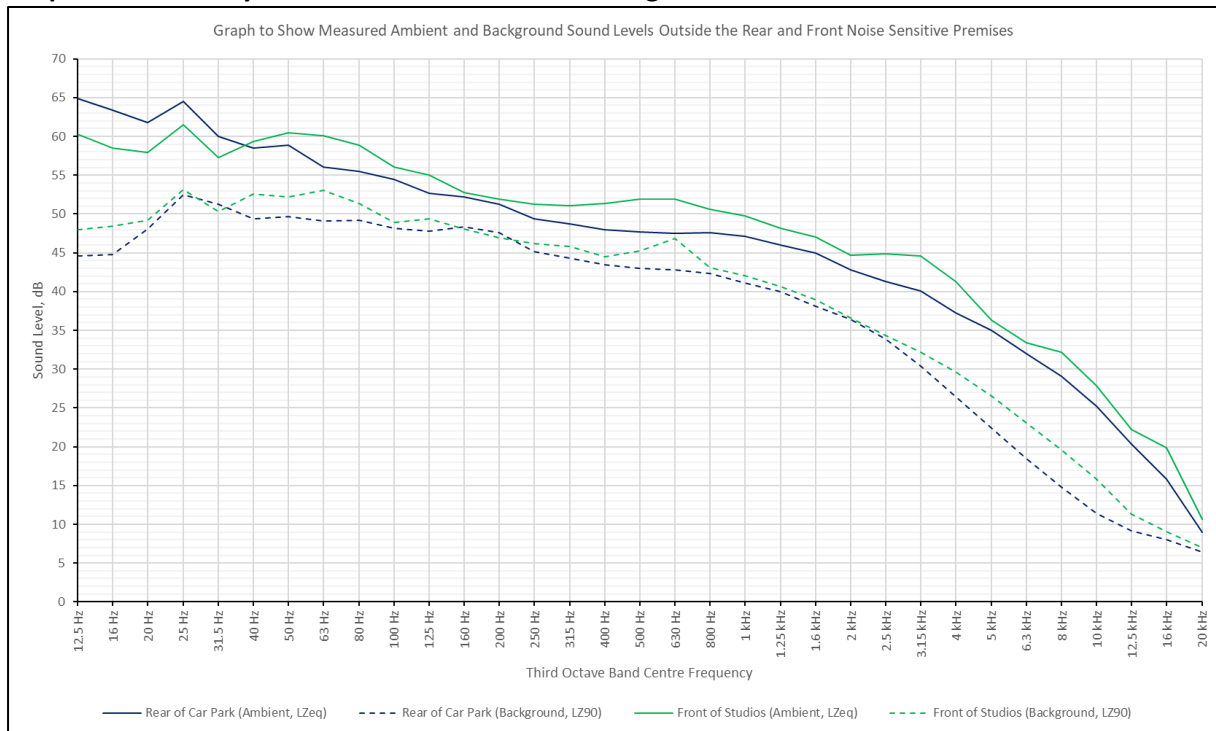
Table 3.1: Summary of Measured Ambient and Background Sound Levels

| Frequency | Rear Car Park (Bateman's Row) 17:45 to 22:45 | | Front (New Inn Yard) 18:00 to 18:45 and 19:30 to 22:30 | |
|--------------------------------|---|--|---|--|
| | Ambient ¹ L _{eq,5hours} , dB | Background ² L _{90,5hours} , dB | Ambient ¹ L _{eq,3hours45mins} , dB | Background ² L _{90,3hours45mins} , dB |
| Broadband (A-weighted) | 56 | 51 | 59 | 53 |
| Third Octave Band (unweighted) | | | | |
| 12.5 Hz | 65 | 45 | 60 | 48 |
| 16 Hz | 63 | 45 | 59 | 48 |
| 20 Hz | 62 | 48 | 58 | 49 |
| 25 Hz | 65 | 52 | 62 | 53 |
| 31.5 Hz | 60 | 51 | 57 | 50 |
| 40 Hz | 59 | 49 | 59 | 53 |
| 50 Hz | 59 | 50 | 61 | 52 |
| 63 Hz | 56 | 49 | 60 | 53 |
| 80 Hz | 56 | 49 | 59 | 51 |
| 100 Hz | 55 | 48 | 56 | 49 |
| 125 Hz | 53 | 48 | 55 | 49 |
| 160 Hz | 52 | 48 | 53 | 48 |
| 200 Hz | 51 | 48 | 52 | 47 |
| 250 Hz | 49 | 45 | 51 | 46 |
| 315 Hz | 49 | 44 | 51 | 46 |
| 400 Hz | 48 | 43 | 51 | 45 |
| 500 Hz | 48 | 43 | 52 | 45 |
| 630 Hz | 48 | 43 | 52 | 47 |
| 800 Hz | 48 | 42 | 51 | 43 |
| 1 kHz | 47 | 41 | 50 | 42 |
| 1.25 kHz | 46 | 40 | 48 | 41 |
| 1.6 kHz | 45 | 38 | 47 | 39 |
| 2 kHz | 43 | 36 | 45 | 37 |
| 2.5 kHz | 41 | 34 | 45 | 34 |
| 3.15 kHz | 40 | 30 | 45 | 32 |
| 4 kHz | 37 | 26 | 41 | 30 |
| 5 kHz | 35 | 22 | 36 | 27 |
| 6.3 kHz | 32 | 18 | 33 | 23 |
| 8 kHz | 29 | 15 | 32 | 20 |
| 10 kHz | 25 | 11 | 28 | 16 |
| 12.5 kHz | 20 | 9 | 22 | 11 |
| 16 kHz | 16 | 8 | 20 | 9 |
| 20 kHz | 9 | 6 | 11 | 7 |

1 – Ambient averages are logarithmic.

2 – Background averages are arithmetic.

Graph 3.1: Summary of Measured Ambient and Background Sound Levels



The measured baseline ambient and background sound levels are typical of a city centre location dominated by road traffic noise. The graph shows that the sound levels at the front of the rear of the Protein Studios buildings are broadly similar which demonstrates there are no other localised significant sources of noise. There are no significant peaks shown in any third octave bands, therefore, no significant narrowband noise sources have been identified.

4 SOUND PROPAGATION TESTS

To determine the internal to external sound reduction from each of the studio spaces, measurements were taken on the afternoon of Wednesday 5th October 2022. Propagation test measurements were taken with the sound system playing a house music track and pink noise. Ambient sound level measurements were taken after each set of external measurements so that certain frequencies of the source measurements (music and pink noise) could be corrected or discounted if they were not significantly above the ambient sound level to avoid contamination of the results from other external noise sources.

The three studio spaces where the internal to external sound propagation sound reduction was measured were Studios 1, 2 & 3; Studio 4; and Studio 5, as shown in Figure 4.1. The sound system location in each studio space is also shown in Figure 4.1. The external sound measurement locations for the propagation tests are shown in Figure 2.1.

Figure 4.1: Protein Studios Layout and Propagation Test Areas



Studios 1, 2 & 3

The sound system was located in a rear corner of the studio space facing the roller shutter door opening onto New Inn Yard. The audience area measurement location was located between the sound system and the roller shutter door. External measurements were taken at the front (New Inn Yard) of the Protein Studios buildings. The external propagation test measurement location is shown in Figure 2.1. The microphones were installed at a height of 1.5 m above ground level and in free-field locations.

Studio 4

The sound system was located on the side wall of the studio space facing the opposite wall. The audience area measurement location was located between the sound system and the opposite wall. External measurements were taken at the front (New Inn Yard) and rear (Bateman's Row) of the Protein Studios buildings. The external propagation test measurement locations are shown in

Figure 2.1. The microphones were installed at a height of 1.5 m above ground level and in free-field locations, apart from the external rear car park measurement, which was at a height of 5 m above ground level.

Studio 5

The sound system was located in the alcove corner of the studio space facing the centre of the studio space. The audience area measurement location was located in the centre of the space. External measurements were taken at the rear (Bateman's Row) and side (Anning Street) of the Protein Studios buildings. The external propagation test measurement locations are shown in Figure 2.1. The microphones were installed at a height of 1.5 m above ground level and in free-field locations, apart from the external rear car park measurement, which was at a height of 5 m above ground level.

Equipment and Calibration

The instrumentation used for the noise surveys were Rion NL-52 Class 1 sound level meters (SLM) (Serial numbers: 00420762, 00420761) and a Rion NC-74 Calibrator (34425554).

The SLM had field calibration checks carried out prior to and immediately following the surveys and no significant deviation was recorded. All instrumentation used has been calibrated to traceable standards within two years.

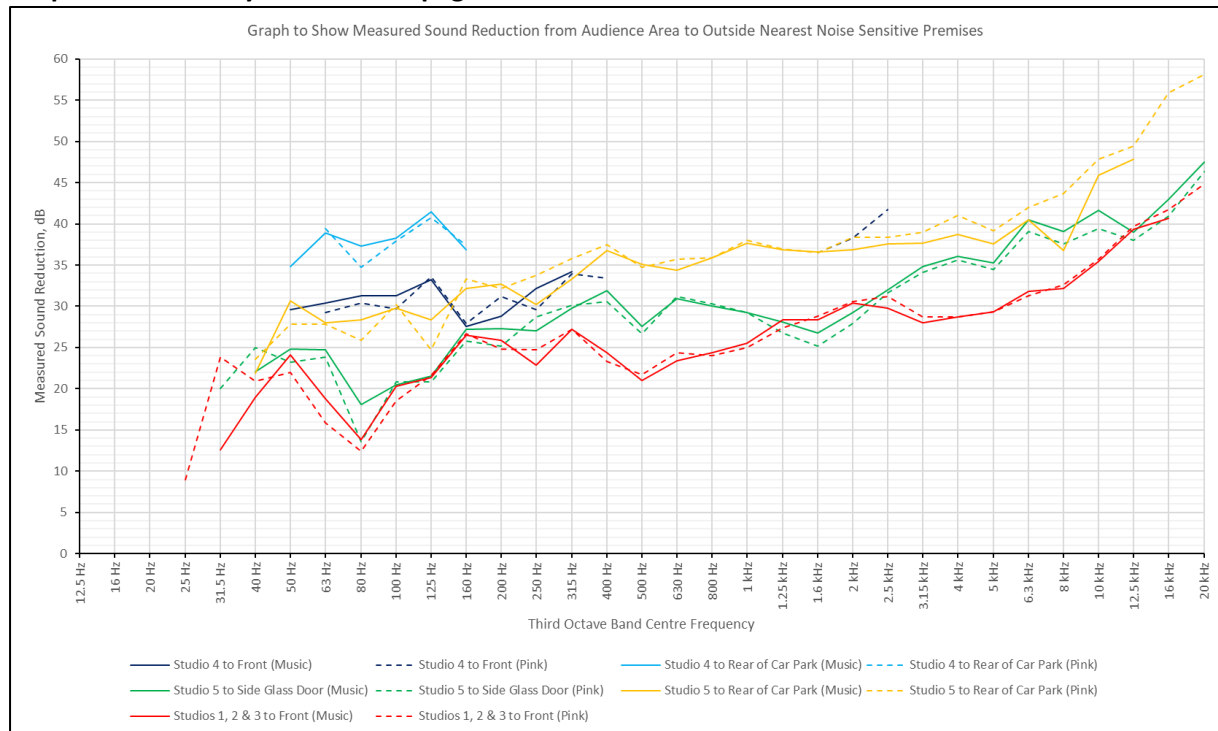
Weather

The meteorological conditions were monitored throughout the duration of the noise survey. There were no periods considered unsuitable for noise monitoring during the survey.

5 SOUND PROPAGATION TEST RESULTS

A summary of the internal to external sound propagation test results are presented in Graph 5.1 below.

Graph 5.1: Summary of Sound Propagation Test Results



The results show that the sound reduction between Studios 1, 2 & 3 and the front is particularly low at 80 Hz. The most significant building element for the sound transfer was the roller shutter door.

For Studio 4 the results show that there is significantly less sound transfer to the nearest noise sensitive premises at the rear of the building than the front and as the front and rear had broadly similar background sound levels the sound level at the front of the building is likely to be the limiting factor.

For Studio 5 the results show that the sound reduction to the rear of the car park was broadly similar to Studio 4. The sound reduction to the side of the building was significantly lower than to the rear of the building however there are no noise sensitive premises adjacent to this side of the building.

Protein Studios Noise Management Summary

Types of Use

The risk of music noise from different uses becoming a disturbance to local noise sensitive residents can be categorised as low, medium and high:

Low – No music or background music only from a playlist (no DJ). The sound system is home hi-fi sized only (no larger than 200 W RMS).

Medium – Music is a secondary element to the use of the studio to create an ambience and may be from a playlist or DJ through a sound system that is larger than 200 W RMS.

High – Music is a primary focus of the use of the studio from a playlist or DJ; or contains any live performance (PA or full band).

Sound Management for Different Uses

Low Risk Use

Where a small sound system is used (< 200 W RMS) for background music from a playlist it is unlikely that music noise will be audible outside the studios if all windows and doors remain closed.

Medium Risk Use

Where music is a secondary element to the use of the studio to create an ambience and may be from a playlist or DJ with a professional sound system (> 200 W RMS) it is likely that the music will be audible externally to the Protein Studios building. However, by restricting the number of uses a year and placing controls on the MNL it will be possible to operate without disturbance to the nearest noise sensitive premises.

A suitable sound system for medium risk uses is one single driver sub-woofer (up to 500 W RMS) and one mid/top frequency box (up to 500 W RMS) per side (L&R). However, for certain uses a more distributed sound system for a more even coverage of a larger area may be more suitable.

High Risk Use

Where music is a primary element to the use of the studio from a playlist, DJ or live performance with a professional sound system (> 200 W RMS) it is likely that the music will be audible externally to the Protein Studios building. However, by communicating with local residents in advance, employing a sound control expert and placing controls on the MNL it will be possible to operate without significant disturbance to the nearest noise sensitive premises on a limited number of days a year.

For all high risk uses of the studios a bespoke NMP will be required to consider the placement of the stage and sound system, nearest noise sensitive premises and sound control methodology appropriate to the specific use.

A suitable sound system for high risk uses is one single driver sub-woofer (up to 500 W RMS) and one mid/top frequency box (up to 500 W RMS) per side (L&R). However, for certain uses a more distributed sound system for a more even coverage of a larger area may be more suitable. Specific layouts may be able to support a larger sound system if required.

Internal Music Noise Levels

The music noise level in the middle of the audience areas for each studio should be controlled to the following sound levels to ensure the external music noise levels are not disruptive to the nearest noise sensitive premises. The internal sound level is given in a 15 minute A-weighted average ($L_{Aeq,15min}$). Additional consideration may need to be given to the low frequency (bass) output of the sound system.

Medium Risk Uses

Studio 2 & 3: $L_{Aeq,15min}$ 62 dB

Studio 4: $L_{Aeq,15min}$ 78 dB

Studio 5: $L_{Aeq,15min}$ 74 dB

High Risk Uses

Studio 2 & 3: $L_{Aeq,15min}$ 72 dB

Studio 4: $L_{Aeq,15min}$ 88 dB

Studio 5: $L_{Aeq,15min}$ 84 dB