



## Noise Impact Assessment

Site Address: Former NatWest Bank, Midway House, Middleton, Manchester, M24 1AZ

Client Name: Goodnews Assemblies of God

Project Reference No: NP-013282



**Authorisation and Version Control**

| Revision | Reported By         | Checked By            |
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**Amendment History**

| Revision | Date       | Summary of Amendments |
|----------|------------|-----------------------|
| 01       | 03/10/2025 | --                    |

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*Delivering sustainable development by promoting good health and well-being through effective management of noise.*

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# 1. Introduction

NOVA Acoustics Ltd has been commissioned to prepare a noise impact assessment for a proposed place of worship ('the proposed development') at Former NatWest Bank, Midway House, Middleton, Manchester, M24 1AZ ('the site').

The applicant has submitted a planning application (Reference: 25/00/782/FUL) to Rochdale Borough Council. This report has been prepared to accompany the planning application submitted to the Local Planning Authority ('LPA').

A noise survey has been undertaken to establish the prevailing sound levels at the proposed development and closest Noise Sensitive Receptors ('NSRs'). The findings have been used to assess the suitability of the site for the proposed use. Measures required to mitigate noise impacts from the proposed development has been assessed in accordance with the relevant performance standards, legislation, policy, and guidance.

This noise assessment is necessarily technical in nature; therefore, a glossary of terms is included in Appendix A to assist the reader.

## 1.1 Standards, Legislation, Policy & Guidance

The following performance standards, legislation, policy and guidance have been considered to ensure good acoustic design in the assessment:

- The LPA's technical guidance & policies, specifically; 'Rochdale Local Plan Core Strategy, Adopted October 2016'
- National Planning Policy Framework (2024)
- Noise Policy Statement for England (2010)
- Entertainment Noise Legislation
- Noise from Pubs and Clubs Final report (NANR92, 2005) – Prepared by Hepworth Acoustics for DEFRA
- Institute of Acoustics ('IOA') 'Good Practice Guide on the Control of Noise from Pubs and Clubs' (2003)

Further information on the legislation can be found in Appendix B.

## 1.2 Proposal Brief

The proposed development is for the conversion of the former Natwest bank building into a place of worship including the ground floor service hall with live music and conference spaces proposed above on the 1<sup>st</sup> floor with ancillary spaces also proposed across both floors.

Figure 1 shows the existing layout of the proposed development building.



Drawings named, PL01 & PL02 supplied by client

Figure 1 – Proposed Development

NOVA Acoustics has been informed of the following:

- Services with live music occur on Friday evenings between 18:00 – 21:00, and Sundays between 10:00 – 13:30. It is assumed that any operational period outside of services will primarily be use of the conference areas and not be subject to high level of noise generative activity.
- It is proposed that the existing internal partitions are removed on the ground floor, to produce an open plan hall space to be used as the main service hall.
- Live music is to be played to accompany service, observations of an existing service showed the use of a drum kit, tambourines, congo drums, keyboards and vocals. All audio is ported through a digital mixing desk and outputted through a fixed PA system. It has been assumed that live music is to be primarily within the service hall and not for the 1<sup>st</sup> floor conference areas.
- The façade of the proposed service hall has existing double glazing (assumed 4mm glass, 16mm air gap, 4mm glass).
- It is understood that the development is to be ventilated using the incorporation of trickle ventilation and at this stage there is no proposed additional external plant, therefore no assessment of plant noise has been undertaken.
- Historically, up to 125 people have attended services, therefore it has been assumed that up to 125 people could occupy worship areas during service.
- There is to be no external patron area, for smoking or queueing.
- Live music events will be held outside of office hours; therefore, no self-impact breakthrough assessment has been carried out. If this is to change, reassessment may be required.

## 2. Environmental Noise Survey

### 2.1 Measurement Methodology

The following table outlines the measurement dates and particulars. The sound level meters used for the survey were fitted with a proprietary environmental kit complete with a 130mm diameter windshield. The survey meteorological conditions and equipment register can be found in Appendix D.

| Location | Survey Dates  | Measurement Particulars                                                                                              |
|----------|---------------|----------------------------------------------------------------------------------------------------------------------|
| MP1      | 19 – 22/09/25 | Microphone affixed to a lamppost 4m above the ground approximately 0.6m from the façade of the proposed development. |

Table 1 – Measurement Methodology

Outlined in the figure below are the site surroundings and measurement locations.



Figure 2 – Measurement Locations and Site Surroundings

### 2.2 Context & Subjective Impression

The area surrounding the site is mixed in nature with residential dwellings and commercial properties in proximity. The noise profile is 'typical' of an urban area and is dominated by road traffic noise emissions from the surrounding local road network. Across the road from the proposed development is the Harbord Wetherspoons public house of which patron noise from people stood out the front was audible.

The (nearest sensitive receptor) NSR1 is to the west in the form of residential dwellings located above nearby commercial premises, approximately 15m from the closest breakout façade element (no shielding).

NSR2 is also to the west on the other side of Long Street, approximately 25m from the closest breakout façade element.

### **Background Sound Level Analysis – Noise Breakout**

The following table outlines the average background sound levels measured during the operational hours of the proposed development that have been used in the subsequent noise breakout assessment.

| Location | Measurement Period ('T') | Octave Frequency Band (Hz, L <sub>A90,15min</sub> dB) |     |     |     |    |    |    | L <sub>A90,15min</sub> (dB) |
|----------|--------------------------|-------------------------------------------------------|-----|-----|-----|----|----|----|-----------------------------|
|          |                          | 63                                                    | 125 | 250 | 500 | 1k | 2k | 4k |                             |
| MP1      | Friday<br>18:00 – 21:00  | 57                                                    | 51  | 50  | 50  | 49 | 43 | 36 | 49                          |
|          | Sunday<br>10:00 – 13:30  | 56                                                    | 52  | 49  | 47  | 47 | 41 | 32 | 47                          |

*Table 2 – Background Sound Level Results Summary – Noise Breakout*

### **Operational Measurements**

An attended survey was undertaken during a Friday evening service at the current operating location of the church. During the service it was observed that live music was present during the service with the use of drums, keyboards and vocals, as well as other handheld percussion instruments.

Shown in the following table are the sound levels measured at the present place of worship at the Church of the Saviour Building, Collyhurst, Manchester, M40 7RN; a live band was performing through the fixed PA system as well as a youth group rehearsing before the beginning of the service.

| Location/Description                                                                            | Octave Band (Hz, L <sub>eq,T</sub> dB) |     |     |     |    |    |    |    | L <sub>Aeq,T</sub> (dB) |
|-------------------------------------------------------------------------------------------------|----------------------------------------|-----|-----|-----|----|----|----|----|-------------------------|
|                                                                                                 | 63                                     | 125 | 250 | 500 | 1k | 2k | 4k | 8k |                         |
| ST1 – Internal of present place of worship – 5m from stage<br>(Pre-service youth band practice) | 88                                     | 89  | 89  | 90  | 83 | 77 | 78 | 72 | 90                      |
| ST2 – Internal of present place of worship – 5m from stage<br>(Duration of Service)             | 83                                     | 83  | 84  | 88  | 81 | 76 | 71 | 68 | 87                      |

*Table 3 – Internal Measurement Results*

The following equipment was used at the existing venue, and it is understood that the equipment is expected to be moved to and used at the proposed site.

- Behringer X32 Rack Mixer
- 4no. Mackie SRM450 – 2 of which are wall mounted
- 2no. Yamaha DSR118W Sub
- 1no. Prosound PA speaker (used as an onstage monitor)

### 3. Internal Noise Breakout Assessment

To ensure the noise emissions from the proposed development do not cause an adverse impact on the surrounding residential NSRs, the noise breaking out of the building must be assessed.

The following relevant information has been provided:

- The sermon may have up to 125no. patrons in attendance.
- The evening sermon is to occur between 18:00 – 21:00 on Friday evenings.
- There is to be live music played through a fixed PA system, through a mixer connected to a laptop which is capable of limiting the output. This will be considered dominant over the attendees.
- Live music may comprise of electric guitar, electric bass, drum kit, vocals and potentially additional handheld percussion instruments.

The internal noise levels were recorded from the existing place of worship as shown in Table 3.

#### 3.1 Acoustic Design Criteria

Please note that all the adopted criteria below are referenced against the NPSE observed effect levels in each assessment within this report.

#### Entertainment Noise Breakout Assessment to Residential Properties

The most appropriate guidance is that contained within the 'The Good Practice Guide on the Control of Noise from Pubs and Clubs'. It is suggested in this document that where 'entertainment' noise takes place on a regular basis, associated sources should be inaudible within noise-sensitive properties at any time.

In order to achieve relative inaudibility within residential properties, it is recommended that noise breakout emissions from the site do not exceed the background sound levels ( $L_{90}$  from Table 2) in each octave band at the external façades of the closest NSRs.

#### 3.2 Noise Breakout Assessment

Noise breakout levels have been assessed to the closest residential receptors. The calculations have been conducted assuming the following:

- The existing building is a minimum 200mm solid masonry structure.
- The entrance and exit to the ground floor worship area will retain the lobbied door system to minimise noise breakout.
- All heating, cooling and ventilation must be provided by mechanical systems and thus, there is no requirement for any passive systems to penetrate the façade and compromise the sound insulation.
- The noise breakout calculations have been conducted assuming the glazing is weakest element.
- Noise breakout calculations have been conducted in accordance with BS12354-4:2000, assuming the formula,  $L_{W,rad} = L_{P,rev} - C_d - R + 10 \cdot \log(S)$ , where;
  - $L_{P,rev}$  are the internal ambient noise levels measured at the applicant current place of worship during a service (Table 3).
  - $S$  is the surface area of the glazed element ( $m^2$ ).

- $C_d$  is the correction for the difference between reverberant internal conditions and non-reverberant external conditions (-5 dB).
- $R$  is the predicted sound reduction provided by the element.
- Distance attenuation ( $A_{tot}$ ) is predicted from a median point of the breakout elements as per the calculation's standard.

Shown below is an annotation of the assumed noise breakout elements.



Figure 3 – Noise Breakout Calculation Points

The resulting  $L_{eq}$  noise breakout emissions at the closest window of the NSRs have been assessed against the adopted criteria in the following tables.

| Description                                                       | Octave Frequency Band (Hz, dB) |           |           |           |            |            |           | Overall (dBA) |
|-------------------------------------------------------------------|--------------------------------|-----------|-----------|-----------|------------|------------|-----------|---------------|
|                                                                   | 63                             | 125       | 250       | 500       | 1k         | 2k         | 4k        |               |
| Measured Internal Noise Level ( $L_{eq}$ )                        | 88                             | 89        | 89        | 90        | 83         | 77         | 78        | 90            |
| 'Standard' Double Glazing (4mm/16mm/4mm)                          | 19                             | 21        | 17        | 25        | 35         | 378        | 31        | --            |
| Internal to External Correction ( $C_d$ )                         | -5                             |           |           |           |            |            |           | --            |
| Sound Power Level of Blocked Windows ( $L_w$ , 18m <sup>2</sup> ) | 77                             | 76        | 80        | 73        | 56         | 48         | 55        | 74            |
| Distance Correction (d=15m, Q4)                                   | -29                            |           |           |           |            |            |           | --            |
| Total External Noise Level at NSR1 ( $L_{eq}$ )                   | 48                             | 47        | 51        | 44        | 27         | 19         | 26        | 45            |
| External Noise Criteria (MP1 Lowest $L_{90}$ )                    | 56                             | 52        | 49        | 47        | 47         | 41         | 32        | 47            |
| <b>Exceedance of Criteria</b>                                     | <b>-8</b>                      | <b>-5</b> | <b>+2</b> | <b>-3</b> | <b>-20</b> | <b>-22</b> | <b>-6</b> | <b>-2</b>     |

Table 4 – Noise Break-out Assessment – NSR1

It should be noted that the results shown above are representative of a 'worst-case' scenario, assuming that the overall loudness is uniform throughout the hall.

The assessments above show that the predicted levels of noise breakout exceed adopted criteria in the 250Hz octave frequency bands. However it should be noted that this is an external noise level and assuming a 13dB reduction from an open window, the internal noise level at the receptor is expected to be below the NR30 noise rating curve in this frequency band and therefore unlikely to give rise to an adverse impact at the NSRs.

### 3.3 Further Mitigation

All amplified music should be limited via a music limiting device.

The mixing desk which is presently used during live music performances is connected to a laptop allowing for the control of the overall output and octave band control.

External acts should be prohibited from using their own equipment unless plugged into the main FoH system through the volume control measures. The noise limiter must be installed, calibrated, and activated by an appropriately experienced noise control consultant/engineer to ensure that the equipment operates effectively.

The maximum amplified music limit levels presented in the following should be set as a baseline, and during the calibration of the equipment, they must be adjusted to achieve relative inaudibility at the closest NSRs.

Based on the room volume and size of the proposed sermons, the limit levels in the following table are deemed adequate.

| Description                          | Octave Frequency Band (Hz, L <sub>Fmax</sub> dB) |     |     |     |    |    |    | Overall (dBA) |
|--------------------------------------|--------------------------------------------------|-----|-----|-----|----|----|----|---------------|
|                                      | 63                                               | 125 | 250 | 500 | 1k | 2k | 4k |               |
| Maximum Amplified Music Limit Levels | 95                                               | 93  | 87  | 85  | 85 | 85 | 83 | 91            |

*Table 5 – Maximum Amplified Background Music Limit Levels*

When the limit levels shown in the above table are applied, the levels of noise breakout are predicted to be within the adopted criteria for each octave frequency band. This would give an indication of 'low impact' and is thought to align with the threshold for a 'No Observed Adverse Effect Level' ('NOAEL') in accordance with the NPSE and NPPF.

This is based on the retention of the existing 'standard' double glazing. Should the glazing specification be subject to change, these maximum amplified music limit levels may be subject to change.

## 4. Noise Management Plan

This Noise Management Plan ('NMP') outlines the methods by which the church management will systematically assess and minimise the potential impacts of noise generated by the site. The NMP is a working document with the specific aim to ensure that:

- Noise impact is considered as part of routine inspections,
- Noise is primarily controlled at source by good operational practices, including physical and management control measures,
- All appropriate measures are taken to prevent or, where that is not reasonably practical, to reduce noise emissions from the venue.

### 4.1 Hours of Operation

The following operating hours shall be adhered to:

- Live music performances must conclude at or before 21:30 hours.
- An additional 15 minutes after the hours stated above shall be allowed for attendees to exit the premises.
- An additional 1-hour after the hours stated above shall be allowed for staff only for the purposes of preparation, cleaning and other ancillary activities associated with the operation of the business.

### 4.2 Internal Amplified Music Noise Levels

- An amplified music limiting device will be installed within the venue capable of controlling noise levels to the values presented in Table 5.
- The music limit levels stated in this report must be considered as a baseline, and during the calibration of the equipment, the limit levels should be adjusted to achieve relative inaudibility at the closest NSRs.
- The noise limiter must be installed and activated by an appropriately experienced noise control consultant/engineer to ensure that the equipment operates effectively.
- It is advised that a distributed P.A. system shall be installed to minimise the internal sound level required to achieve a uniform and distributed music level.
- Where possible, external windows and doors should remain closed at all times when live music is to be performed within the service hall.
- Doors should be fitted with a self-closing mechanism.

### 4.3 Dispersal of Attendees

A member of the church management should be positioned in an area close to the main exit to oversee the end of night departure period to ensure that:

- Members of the congregation are encouraged to be considerate upon leaving the premises,
- Members of the congregation should not leave the premises other than by the doors and exits they are guided towards,
- Communication is made with taxi companies regarding the use of horns and slamming of doors.

Further to this, prominent, clear and legible notices will be displayed at the exit requesting church attendees to respect residents and to leave the premises and the area quietly.

#### 4.4 Continuous Subjective Noise Monitoring

- All church management will, as part of their induction, be made aware of the surrounding NSRs and the effects of noise on residential dwellings. It is the responsibility of all management to be aware of noise on site and to report any potential noise issues to the premises manager at the earliest opportunity.
- All church management will have refresher training on noise issues, prevention and managements at six-monthly intervals.

#### 4.5 Noise Complaint Investigation

An Issue Management System ('IMS') will be implemented and completed by the church management. This will include records of subjective noise monitoring and complaints. Further to this, a complaints procedure will be implemented. This procedure will allow for all complaints, feedback and requests made by third parties regarding the premises operational activities.

A phone number for the premises will be made available online to allow any member of the public to lodge a complaint without entering the premises. The premises manager will be specifically assigned to deal with complaints.

All complaints received from third parties including statutory authorities, statutory consultees, members of the general public and representatives of the church will be forward to the premises manager to action as below within 1-hour (where feasible). The complaint will be logged in the complaints log within 24-hours.

The live event manager will ensure that:

- The complaint is investigated to identify the cause, if necessary, this may involve direct communication with the complainant.
- In the event of elevated noise being detected, action will be taken immediately to prevent a recurrence of the same problem. These actions must be documented.
- The complainant will be contacted and given information on the investigations conducted and actions taken as appropriate.
- Details of other complaints are sent to other company personnel as appropriate.
- If the investigation indicates that the complaint has not been justified this will be clearly recorded on the incident report.
- All complaints will be logged.

The NMP will be reviewed annually or as agreed appropriate to ensure it is streamlined and effective. New and innovative approaches to problem-solving or incidents and any lessons learnt will be incorporated accordingly.

This is considered to be a 'live document' which evolves by experience in agreement with the Local Authority.

## 5. Conclusion and Action Plan

The proposed development has been assessed against the acoustic design criteria, and a sound insulation and noise control scheme has been provided to ensure the criteria has been achieved.

Providing the upgraded blocked-up window detail is implemented, and an octave band amplified music limiter is installed, the noise breakout emissions are predicted to not exceed the lowest measured  $L_{90,T}$  background sound levels in any octave frequency bands at the closest NSRs.

The findings are an indication of 'low impact' and which are thought to align with the threshold for a 'No Observed Adverse Effect Level' ('NOAEL') in accordance with the NPSE and NPPF.

The following 'Action Plan' is outlined to ensure the design considerations and specifications from this report are duly implemented:

1. Any amplified background music within the worship hall should be ported through the existing mixing desk, and output levels controlled via a frequency specific music limiting device to ensure the limit level shown in Table 5 are adhered to. An example product is given in Section 3.3.
2. Windows should remain closed when noisy activities (such as live music) are being undertaken within the facility. It is understood that through-frame ventilation will be used during these activities.
3. The provided noise management plan outlined in Section 4 should be implemented and adhered to throughout the lifetime of the development.

The findings of this report will require written approval from the Local Authority prior to work commencing.

## Appendix A – Acoustic Terminology

|                                                                    |                                                                                                                                                                                                                                                   |
|--------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A-weighted sound pressure level, $L_{pA}$                          | Quantity of A-weighted sound pressure given by the following formula in decibels (dBA). $L_{pA} = 10 \log_{10} (pA/p_0)^2$ . Where: $pA$ is the A-weighted sound pressure in pascals (Pa) and $p_0$ is the reference sound pressure (20 $\mu$ Pa) |
| Background Sound                                                   | Underlying level of sound over a period, $T$ , which might in part be an indication of relative quietness at a given location                                                                                                                     |
| Equivalent continuous A-weighted sound pressure level, $L_{Aeq,T}$ | Value of the A-weighted sound pressure level in decibels (dB) of a continuous, steady sound that, within a specified time interval, $T$ , has the same mean-squared sound pressure as the sound under consideration that varies with time         |
| Facade level                                                       | Sound pressure level 1 m in front of the facade                                                                                                                                                                                                   |
| Free-field level                                                   | Sound pressure level away from reflecting surfaces                                                                                                                                                                                                |
| Indoor ambient noise                                               | Noise in a given situation at a given time, usually composed of noise from many sources, inside and outside the building, but excluding noise from activities of the occupants                                                                    |
| Noise Criteria                                                     | Numerical indices used to define design goals in a given space                                                                                                                                                                                    |
| Noise Rating (NR)                                                  | Graphical method for rating a noise by comparing the noise spectrum with a family of noise rating curves                                                                                                                                          |
| Octave Band                                                        | Band of frequencies in which the upper limit of the band is twice the frequency of the lower limit                                                                                                                                                |
| Percentile Level, $L_{AN,T}$                                       | A-weighted sound pressure level obtained using time-weighting “F”, which is exceeded for $N\%$ of a specified time interval                                                                                                                       |
| Rating Level, $L_{Ar,Tr}$                                          | Equivalent continuous A-weighted sound pressure level of the noise, plus any adjustment for the characteristic features of the noise                                                                                                              |
| Reverberation time, $T$                                            | Time that would be required for the sound pressure level to decrease by 60 dB after the sound source has stopped                                                                                                                                  |
| Sound Pressure, $p$                                                | root-mean-square value of the variation in air pressure, measured in pascals (Pa) above and below atmospheric pressure, caused by the sound                                                                                                       |
| Sound Pressure Level, $L_p$                                        | Quantity of sound pressure, in decibels (dB), given by the formula: $L_p = 10 \log_{10} (p/p_0)^2$ . Where: $p$ is the root-mean-square sound pressure in pascals (Pa) and $p_0$ is the reference sound pressure (20 $\mu$ Pa)                    |
| Weighted sound reduction index, $R_w$                              | Single-number quantity which characterizes the airborne sound insulating properties of a material or building element over a range of frequencies                                                                                                 |

## Appendix B – Standards, Legislation, Policy, and Guidance

This report is to be primarily based on the following standards, legislation, policy and guidance.

### B.1 – National Planning Policy Framework (2024)

Government policy on noise is set out in the National Planning Policy Framework (NPPF), updated in 2024. This replaced all earlier guidance on noise and places an emphasis on sustainability. In section 15, Conserving and enhancing the natural and local environment, paragraph 187e, it states:

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

Paragraph 198 states:

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

- a) Mitigate and reduce to a minimum potential adverse impact resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;*
- b) Identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason; and*
- c) Limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.*

### B.2 – Noise Policy Statement for England (2010)

Paragraph 198 of the NPPF also refers to advice on adverse effects of noise given in the Noise Policy Statement for England (NPSE). This document sets out a policy vision 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.

To achieve this vision the Statement identifies the following three 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.

In achieving these aims the document introduces significance criteria as follows:

**SOAEL – Significant Observed Adverse Effect Level**

This is the level above which significant adverse effects on health and quality of life occur. It is stated that *“significant adverse effects on health and quality of life should be avoided while also considering the guiding principles of sustainable development”*.

**LOAEL – Lowest Observed Adverse Effect Level**

This is the level above which adverse effects on health and quality of life can be detected. It is stated that the second aim above lies somewhere between LOAEL and SOAEL and requires that: *“all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also considering the guiding principles of sustainable development. This does not mean that such adverse effects cannot occur.”*

**NOEL – No Observed Effect Level**

This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise. This can be related to the third aim above, which seeks: *“where possible, positively to improve health and quality of life through the pro-active management of noise while also considering the guiding principles of sustainable development, recognising that there will be opportunities for such measures to be taken and that they will deliver potential benefits to society. The protection of quiet places and quiet times as well as the enhancement of the acoustic environment will assist with delivering this aim.”*

The NPSE recognises that it is not possible to have a single objective noise-based measure that is mandatory and applicable to all sources of noise in all situations and provides no guidance as to how these criteria should be interpreted. It is clear, however, that there is no requirement to achieve noise levels where there are no observable adverse impacts but that reasonable and practicable steps to reduce adverse noise impacts should be taken in the context of sustainable development and ensure a balance between noise sensitive and the need for noise generating developments.

Any scheme of noise mitigation outlined in this report will, therefore, aim to abide by the above principles of the NPPF and NPSE whilst recognizing the constraints of the site.

**B.3 – BS8233:2014 ‘Guidance on Sound insulation and noise reduction for buildings’**

BS8233 provides guidance on noise levels from sources without specific character in the built environment, based on the recommendations of the World Health Organization; specifically, ‘WHO Guidelines on Community Noise, 1999’. The Guidelines on Community Noise (1999) document defines community noise to include noise from “industries” and “construction”. The desirable criteria levels of steady state, “anonymous” noise in unoccupied spaces within dwellings, from sources such as road traffic, mechanical services and other continuously running plant, are tabulated below.

| Activity                      | Location         | Daytime<br>(07:00 – 23:00) | Night-time<br>(23:00 – 07:00)                |
|-------------------------------|------------------|----------------------------|----------------------------------------------|
| Resting                       | Living Room      | 35 dB $L_{Aeq,16hour}$     | --                                           |
| Dining                        | Dining Room/Area | 40 dB $L_{Aeq,16hour}$     | --                                           |
| Sleeping<br>(daytime resting) | Bedroom          | 35 dB $L_{Aeq,16hour}$     | 30 dB $L_{Aeq,8hour}$<br>45 dB $L_{AFmax}^*$ |

Table 6 – BS8233:2014 Internal Ambient Noise Level Criteria

*\*ProPG:2017 states that's good acoustic design can be used so that individual noise events do not normally exceed 45 dB  $L_{AFmax}$  more than 10 time a night within noise sensitive rooms such as bedrooms. However, where it is not reasonably practicable to achieve the guideline then the judgment of acceptability will depend not only on the maximum noise levels but also on factors such as the source, number distribution, predictability and regularity of noise events.*

It is noted, however, that where development is considered necessary or desirable, despite external noise level above WHO guidelines, the above target levels may be relaxed by up to 5 dB.

General recommendations for mitigation to enable these targets to be achieved are provided, including the use of bunds and barriers to reduce external noise and space planning and sound insulation for the control of internal noise levels.

For this assessment, the above criteria are considered to be the 'LOAEL' as defined in the NPSE in Appendix B.

#### B.4 Entertainment Noise Legislation

Noise from entertainment venues, e.g. noise from recorded music, live bands or karaoke, can be particularly annoying for residents and business if it is not adequately contained within the venue. When considering the potential impact of a proposal for a entertainment premises or residential near to entertainment premises a consideration for the overall noise level ( $L_{Aeq}$ ) and the 63Hz and 125Hz octave band noise levels. Music noise in the 63Hz and 125Hz octave bands, which is described as 'bass noise' is particularly difficult to contain and the impulsive and non-steady character of low frequency music noise is particularly disturbing for residents exposed to it.

A lively city centre bar can operate around 95 dB  $L_{Aeq}$  and nightclubs can be even higher at 105 dB  $L_{Aeq}$ . The range of level of 63Hz and 125Hz octave bands is wider than the a-weighted levels and can be up to 115 dB  $L_{eq}$  and 110 dB  $L_{eq}$  respectively (Davies et al 2005).

There is a lack of consensus on an assessment method for noise levels within habitable rooms regarding entertainment noise. The design aim should be to design to 'inaudible'\*. The building structure is therefore key, and will usually involve a high performing solution in either the music venue or residential premises. Existing noise standards/criteria are not appropriate for evaluating low frequency noise; in almost all other situations the established noise descriptors are based on the A-weighted sound level (dBA) which effectively filters out low frequency sound (Moorhouse et al 2011).

*\*Noise is considered to be inaudible when it is at a sufficiently low level such that it is not recognizable as emanating from the source in question and it does not alter the perception of the ambient noise*

environment that would prevail in the absence of the source in question. The DEFRA report 'Noise from Pubs and Clubs – Phase 1', which, on page 17 reproduces the Institute of Acoustics (IOA) working group guidance to achieve music noise levels which are 'virtually inaudible' inside a residential property.

When dealing with noise control, especially at the lower frequencies it is usual to look at the octave band data as a Z-weighting (linear) and not the A-weighting, due in main to the amount you have to 'take off', resulting in meaningless data (-26.2dB at 63Hz) and also with respect to the sound insulation performance of various constructions materials. Rather than just A-weighted levels being assessed e.g. internal noise levels as per BS8233:2014; a low frequency band analysis should be carried out (McCullough *et al* 2004).

In the 'Procedure for the assessment of low frequency noise complaints – Revision 1', Moorhouse *et al* (2011) use limits for low frequency noise levels in 1/3 octave bands between 10Hz and 160Hz. For the assessment of low frequency music noise, it is more practical to consider the 63Hz and 125 Hz octave bands. The Noise Council's Code of Practice on 'Environmental Noise Control at Concerts' suggests limits on both these octave bands. The DEFRA report 'Noise from Pubs and Clubs – Phase 1' suggests limits on 1/3 octave bands. However, the problem with this suggestion, and one of the reasons it is not widely used, is due to the difficulty in obtaining 1/3 octave band sound insulation performance data for various construction materials. With regards to assessing music noise at the 63 Hz and 125 Hz octave band levels a good correlation is shown between the NR 15 curve and Moorhouse curve at low frequencies. See figure below.

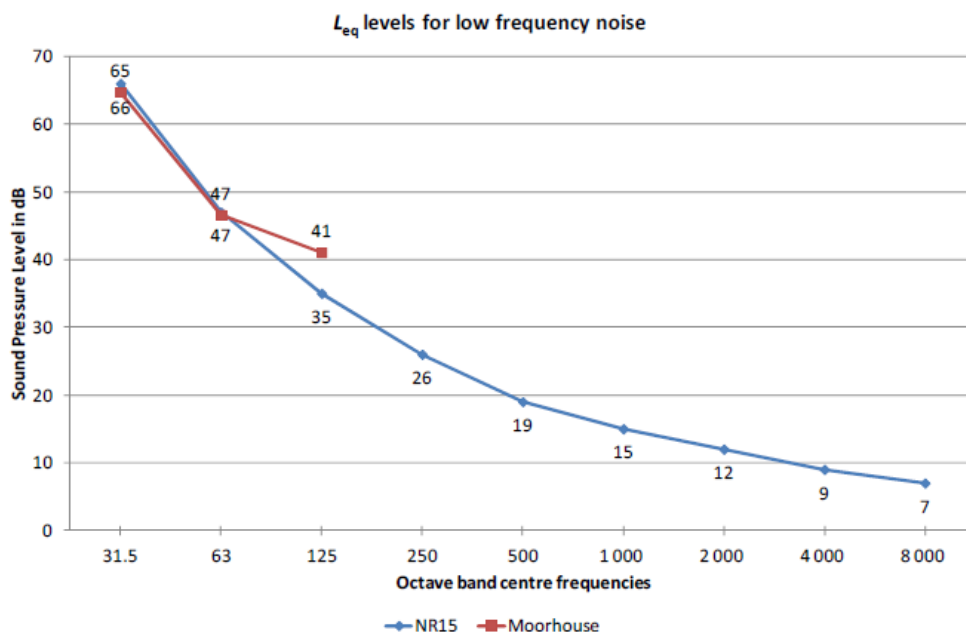


Figure 4 – Moorhouse Low Frequency Noise Rating Curve

However, The NR curve may be too stringent at mid and higher frequencies and may be lower than background noise levels in habitable spaces. Further, the NR curve is most commonly used to set limits for mechanical services noise in buildings i.e. steady, continuous noise sources. Music noise has distinctive characteristics and as such can be described as unsteady and non-continuous in comparison. Even though the Moorhouse curve does not specifically relate to entertainment noise (as per the caveat in the revised edition) these levels provide a good practical basis to assess low frequency music noise. They also provide a workable prediction for planning applications and a measurement method and

assessment for in-situ low frequency issues in existing habitable spaces. Therefore, a criterion that would achieve a condition of 'inaudible' / 'virtually inaudible' which is applicable for new residential developments that are structurally connected to entertainment venues (or vice versa) would be: *'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 ( $L_{eq}$ ), respectively'*. This criterion may also be applicable for new residential developments that are structurally separate from an existing entertainment venue.

*References:*

- i) *Institute of Acoustics (2002) – Good practice guide on the control of noise from pubs and clubs – Draft Annex 2.*
- ii) *McCullough et al (2004) A practical evaluation of objective noise criteria used for the assessment of disturbance due to entertainment music.*
- iii) *Moorhouse et al (2005) Proposed criteria for the assessment of low frequency noise disturbance, Defra (updated in 2008 and 2011).*

## Appendix C – Drawings and Plans

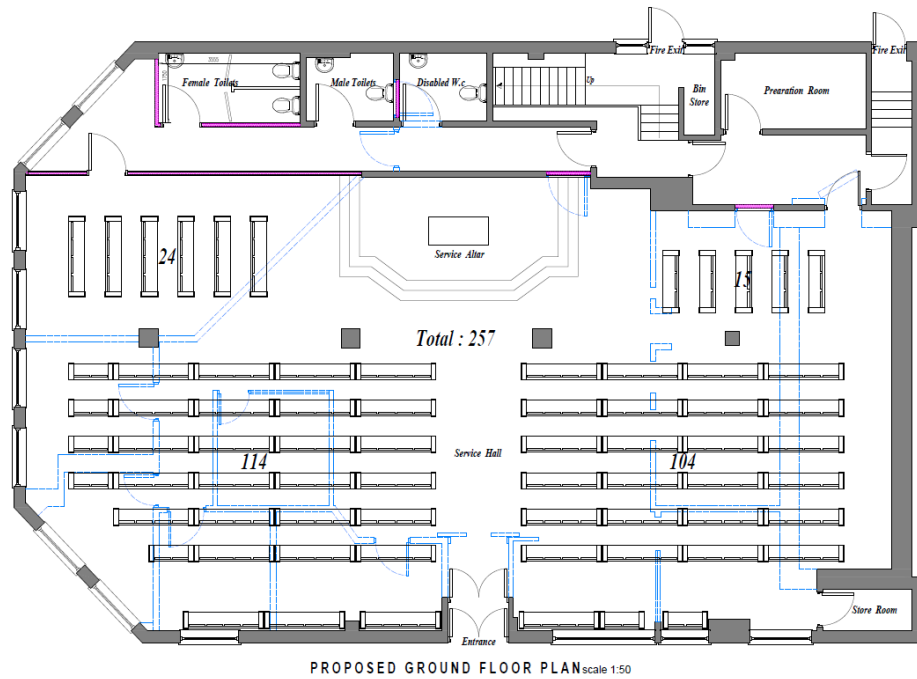


Figure 5 – Basement Floor Plan



Figure 6 – 1<sup>st</sup> Floor Plan

## Appendix D – Environmental Survey

### D.1 – Time History Noise Data

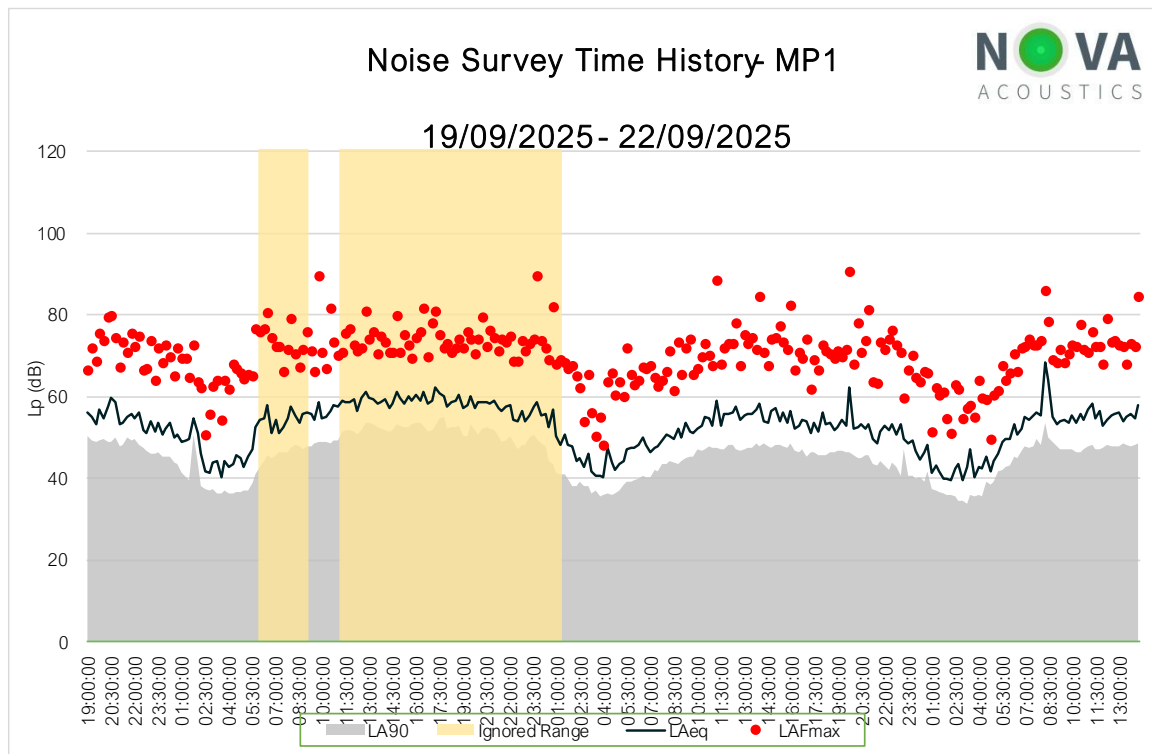


Figure 7 – MP1 Noise Survey Time History

### D.2 – Surveying Equipment

| Piece of Equipment                       | Serial No. | Calibration Deviation |
|------------------------------------------|------------|-----------------------|
| Svantek SV971A Class 1 Sound Level Meter | 141425     | ≤0.1                  |
| Svantek SV33B Class 1 Calibrator         | 163803     |                       |
| Svantek SV971A Class 1 Sound Level Meter | 87871      | ≤0.1                  |
| Svantek SV33B Class 1 Calibrator         | 163803     |                       |
| Cesva SC250 Class 1 Sound Level Meter    | T25        | ≤0.1                  |
| Svantek SV33B Class 1 Calibrator         | 163803     |                       |

Table 7 – Surveying Equipment

All equipment used during the survey was field calibrated at the start and end of the measurement period with a negligible deviation of  $\leq 0.1$  dB. All sound level meters are calibrated every 24 months and all calibrators are calibrated every 12 months, by a third-party calibration laboratory. All microphones were fitted with a protective windshield for the entire measurements period. Calibration certificates can be provided upon request.

### D.3 – Meteorological Conditions

As the environmental noise survey was carried out over a long un-manned period no localised records of weather conditions were taken. However, all measurements have been compared with met office weather data of the area, specifically the closest weather station, and the data from the weather station is outlined in the table below. When reviewing the time history of the noise measurements, any scenarios that were considered potentially to be affected by the local weather conditions have been omitted.

The analysis of the noise data includes statistical and percentile analysis and review of minimum and maximum values, which aids in the preclusion of any periods of undesirable weather conditions. The weather conditions were deemed suitable for the measurement of environmental noise in accordance with BS7445 Description and Measurement of Environmental Noise. The table below presents the average temperature, wind speed and rainfall range for each 24-hour period during the entire measurement.

| Weather Conditions – Rochdale (Approx. 7km NW of Site)                                                                               |               |                          |                           |                  |
|--------------------------------------------------------------------------------------------------------------------------------------|---------------|--------------------------|---------------------------|------------------|
| Time Period                                                                                                                          | Air Temp (°C) | Rainfall (mm/h)          | Prevailing Wind Direction | Wind Speed (m/s) |
| 19/09/25: 00:00 – 23:59                                                                                                              | 15.6 – 18.8   | 0.0 – 1.8 <sup>[1]</sup> | SW                        | 0.0 – 4.7        |
| 20/09/25: 00:00 – 23:59                                                                                                              | 7.9 – 15.7    | 0.0 – 13.2               | SSW                       | 0.0 – 7.0        |
| 21/09/25: 00:00 – 23:59                                                                                                              | 5.2 – 13.9    | 0.0 – 0.6                | WNW                       | 0.0 – 5.0        |
| 22/09/25: 00:00 – 23:59                                                                                                              | 3.0 – 14.4    | 0.0                      | ESE                       | 0.0 – 4.5        |
| <b>Notes:</b><br>[1] The downpour of rain shown above occurred outside of the survey period and did not affect the recorded results. |               |                          |                           |                  |

Table 8 – Survey Weather Conditions



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