

Stand Golf Club Whitefield



Noise Impact Assessment Report Report 29394.NIA.01

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Report 29394.NIA.01			
Revision History			
First Issue Date: 24/02/2025			
A		D	
B		E	
C		F	
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1.0 INTRODUCTION

This report has been prepared by KP Acoustics on behalf of Westshield Ltd to support a planning application for a new clubhouse at Stand Golf Club, Whitefield, M45 7NL.

This report presents the results of the environmental survey undertaken in order to measure prevailing background noise levels and outlines a preliminary assessment of noise from the following sources:

- Entertainment noise emissions from the clubhouse to nearby receptors via the façade.
- Fixed plant noise emissions to nearby receptors.

The assessments provided herein are indicative and serve to demonstrate the potential for compliance with the relevant noise limits. The actual acoustic performance of the overall construction will depend on many variables such as workmanship and detailing.

2.0 NOISE ASSESSMENT GUIDANCE

2.1 Local Authority Guidance

The proposed development falls within the jurisdiction of Bury Council (BC). There is no published guidance from Bury Council on specific criteria for the assessment of noise emissions from new developments, however it is common for Local Authorities to make reference to BS 4142:2014 for plant noise emissions. More bespoke criteria are often adopted for the control of operational/entertainment noise.

For entertainment noise emissions, it is proposed to adopt the guidance provided in Manchester City Council's 'Planning and Noise' Technical Guidance Document (October 2022), the relevant extracts of this guidance are presented below.

Noise from Proposed Entertainment Venues

'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'.

2.2 BS4142: 2014 'Methods for rating and assessing industrial and commercial sound'

British Standard BS4142:2014 'Methods for rating and assessing industrial and commercial sound' describes a method for rating and assessing sound of an industrial and/or commercial nature, which includes:

- Sound from industrial and manufacturing processes
- Sound from fixed installations which comprise mechanical and electrical plant and equipment

- Sound from the loading and unloading of goods and materials at industrial and/or commercial premises, and
- Sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes.

This Standard compares the Rating Level due to the noise source/s under assessment for a one-hour period during the daytime (07:00 – 23:00 hours) and a fifteen-minute period during the night-time (23:00 – 07:00 hours) with the existing background noise level in terms of an L_{A90} when the noise source is not operating.

It should be noted that the Rating Level is the Specific Sound Level in question (L_{Aeq, T_r}), including any relevant acoustic feature corrections, as follows:

- **Tonality** – *‘For sound ranging from not tonal to prominently tonal the Joint Nordic Method gives a correction of between 0dB and +6dB for tonality. Subjectively, this can be converted to a penalty of 2dB for a tone which is just perceptible at the noise receptor, 4dB where it is clearly perceptible, and 6dB where it is highly perceptible’*
- **Impulsivity** – *‘A correction of up to +9dB can be applied for sound that is highly impulsive, considering both the rapidity of the change in sound level and the overall change in sound level. Subjectively, this can be converted to a penalty of 3dB for impulsivity which is just perceptible at the noise receptor, 6dB where it is clearly perceptible, and 9dB where it is highly perceptible’*
- **Intermittency** – *‘If the intermittency is readily distinctive against the residual acoustic environment, a penalty of 3dB can be applied’*
- **Other sound characteristics** – *‘Where the specific sound features characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive against the residual acoustic environment, a penalty of 3dB can be applied’*

Once the Rating Level has been obtained, the representative background sound level is subtracted from the Rating Level to obtain an initial estimate of the impact, as follows:

- Typically, the greater this difference, the greater the magnitude of the impact
- A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context
- A difference of around +5 dB could be an indication of an adverse impact, depending on the context
- The lower the rating level is relative to the measured background sound level, the less likely it is that there will be an adverse impact or significant adverse impact. Where

the rating level does not exceed the background sound level, this is an indication of the specific sound having a low impact, depending on the context

NOTE: Adverse impacts may include but not be limited to annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact.

The initial estimate of the impact may then be modified by taking consideration of the context in which the sound occurs.

3.0 SITE SURVEYS

3.1 Site Description

The site is located on the grounds of Stand Golf Club, off Ringley Road and is bounded by open land to most directions, with some residential receptors to the south-east. At the time of the survey, the background noise climate was dominated by distant road traffic noise from surrounding roads.

3.2 Environmental Noise Survey Procedure

A noise survey was undertaken on the proposed site as shown in Figure 2.1. Continuous automated monitoring was undertaken for the duration of the survey between 15:00 hours on 14/06/2024 and 15:00 hours on 21/06/2024.

Weather conditions were generally dry with light winds and therefore suitable for the measurement of environmental noise.

3.3 Measurement Positions

The environmental noise measurement position and the closest noise sensitive receiver relative to the development are described within Table 3.1 and shown within Figure 3.1.

Icon	Descriptor	Location Description
	Noise Measurement Position 1	The microphone was installed approximately 1.5m above ground level in free-field conditions.
	Noise Sensitive Receptor (NSR)	The nearest noise sensitive receptor is 96 Ringley Road, approximately 85 m from the proposed clubhouse.

Table 3.1 Measurement positions and descriptions



Figure 3.1 Site measurement positions (Image Source: Google Maps)

3.4 Equipment

The equipment calibration was verified before and after use and no abnormalities were observed. The equipment used is described within Table 3.2.

Measurement instrumentation		Serial no.	Date	Cert no.
Larson Davis CAL200 Class 1 Calibrator		17148	21/03/2023	UCRT23/13 63
Noise Kit 34	NTI Audio XL2 Class 1 Sound Level Meter	A2A- 21069-E0	04/08/2022	UK-22-077
	Free-field microphone NTI Acoustics MC230A	A23544		
	Preamp NTI Acoustics MA220	11020		
	NTI Audio External Weatherproof Shroud	-	-	-

Table 3.2 Measurement instrumentation

3.5 Results

The L_{Aeq} : 5min, L_{Amax} : 5min, L_{A10} : 5min and L_{A90} : 5min acoustic parameters were measured throughout the duration of the survey. Measured levels are shown as a time history in Figure 29394.TH1 and are summarised in Table 3.3. Typical background noise levels have been determined in accordance with the guidance set out in BS 4142:2014.

Position	Typical $L_{A90,5min}$ (dB)	
	Daytime (07:00-23:00)	Night-time (23:00-07:00)
1	47	35

Table 3.3 Measured noise levels for daytime and night time

The typical octave band background sound levels measured are presented below for the period 19:00 – 23:00 hours.

Position	Typical Background Sound Level ($L_{90,5min}$, dB) at Octave Band Centre Frequency (Hz)						
	63	125	250	500	1k	2k	4k
1	49	42	37	40	44	36	30

Table 3.4 Typical background noise levels

4.0 ASSESSMENT OVERVIEW

The following sections present our assessment of the various potential noise impacts associated with the development proposals, covering:

- **Entertainment Noise Breakout:** The assessment of noise emissions from the operation of the clubhouse breaking out to nearby receptors via the building facade.
- **Fixed Plant Noise Emissions:** Setting plant noise emission limits in accordance with BS 4142:2014.

Noise output from the clubhouse is likely to be insignificant unless there are private functions underway. It is understood that birthday parties are not usually permitted, and functions would typically comprise either wedding parties, or club member events, at a frequency of around 1 or 2 per month.

Typical noise levels for a wedding event have been established based on historical measurements undertaken by KP Acoustics on similar developments and are set out below.

Description	Typical Noise Level ($L_{eq,5min}$, dB) at Octave Band Centre Frequency (Hz)							dBA
	63	125	250	500	1k	2k	4k	
Wedding party	88	93	85	81	83	78	75	76

Table 4.1 Typical noise levels

Internal layout drawings have not yet been received, therefore all assessment undertaken herein is preliminary in nature, with the intention that this assessment would be updated once details become finalised. In all cases, pessimistic assumptions have been made, such as the location and size of internal function room areas.

5.0 ENTERTAINMENT NOISE BREAKOUT ASSESSMENT

5.1 Criteria

In the absence of specific criteria from Bury Council, Guidance has been drawn from Manchester City Council guidance which recommends that noise (L_{eq}) breaking out through the building frontage of an entertainment venue should not exceed 5 dB below the background noise level (L_{90}) at all octave band frequencies at the nearest residential windows.

The following limits would therefore apply at the nearest residential receptor for new entertainment noise sources within the proposed development.

Location	Entertainment Noise Level Limit ($L_{Aeq,5min}$, dB) at Octave Band Centre Frequency (Hz)						
	63	125	250	500	1k	2k	4k
All nearby receptors	44	37	32	35	39	31	25

Table 5.1 Entertainment noise limits

5.2 Overview / Parameters

The assessment has drawn upon typical noise levels as presented in Section 4.0.

This assessment has considered the use of standard double glazing to the clubhouse, with the following minimum sound reduction performance. The below are extremely pessimistic and should be readily achieved with most standard double-glazed units.

Description	Sound Reduction Index (R dB) at Octave Band Centre Frequency (Hz)						
	63	125	250	500	1k	2k	4k
Glazing ($R_w + C_{tr}$ 27 dB)	15	21	20	26	38	37	39

Table 5.2 Estimated sound reduction performance of glazing

The assessment has assumed that open windows would not be relied upon as a means of ventilation for any noisy internal areas and would not be opened during noisy events. The same has been assumed for doors, which should not be left open to any internal space which is subject to elevated noise levels.

5.3 Preliminary Assessment of Noise Breakout

Noise breakout has been assessed to the nearest receptor based on standard calculation procedures for reverberant noise breakout and the source noise levels and sound reduction performances in Section 5.2. The resultant external noise level has been calculated using the following equation:

$$SPL_{out} = SPL_{in} - SRI + 10\log_{10}\left(\frac{S}{r^2}\right) - 14$$

Where:

SRI estimated sound reduction performance of façade element

r distance from radiating element to receptors

S approximate area of radiating element

Restaurant to Manchester Opera House	Octave Band Centre Frequency (Hz)						
	63	125	250	500	1k	2k	4k
Internal noise level (dB L_{eq})	88	93	85	81	83	78	75
Distance & radiating area propagation correction (dB)	-21	-21	-21	-21	-21	-21	-21
Internal diffuse field to external free-field hemispherical radiation correction (dB)	-14	-14	-14	-14	-14	-14	-14
Façade sound reduction (dB R)	15	21	20	26	38	37	39
External noise level (dB L_{eq})	38	37	30	20	10	6	1
Maximum Criterion (dB L_{eq})	44	37	32	35	39	31	25
Compliant with Criterion ?	✓	✓	✓	✓	✓	✓	✓

Table 5.3 Noise breakout from clubhouse to nearest receptor

As demonstrated above, assessment of entertainment noise breakout indicates that noise should be readily controllable through appropriate management of each space and standard double glazing.

The above would be subject to review once design details have been finalised.

6.0 FIXED PLANT NOISE EMISSIONS

With consideration for the recommendations contained within BS 4142:2014 and based upon the typical background sound levels measured at the site, the following plant noise emission limits would apply at the nearest noise sensitive receptors.

Period	Plant Noise Emission Limit at the Nearest Receptor
Daytime (07:00 - 23:00)	42 dB $L_{Ar,1h}$
Night-time (23:00 - 07:00)	30 dB $L_{Ar,15min}$

Table 6.1 Fixed plant noise emission limits

Noise shall be assessed in accordance with BS 4142:2014 with corrections applied for any plant emitting noise of a tonal or irregular quality. Emergency plant items (e.g. standby generators, smoke extract equipment) should be subject to more relaxed criteria.

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

7.0 CONCLUSION

An environmental noise survey has been undertaken at Stand Golf Club, Whitefield allowing the assessment of noise emissions from the proposed clubhouse.

An assessment of operational noise breakout to nearby receptors has indicated that the suitable noise levels should be readily achievable at nearby receptors through appropriate design and specification of façade elements.

Fixed plant noise emission limits have been set for new items of fixed plant associated with the development.

Stand Golf Club, Whitefield - Position 1
Environmental Time History
14/11/2024 to 18/11/2024

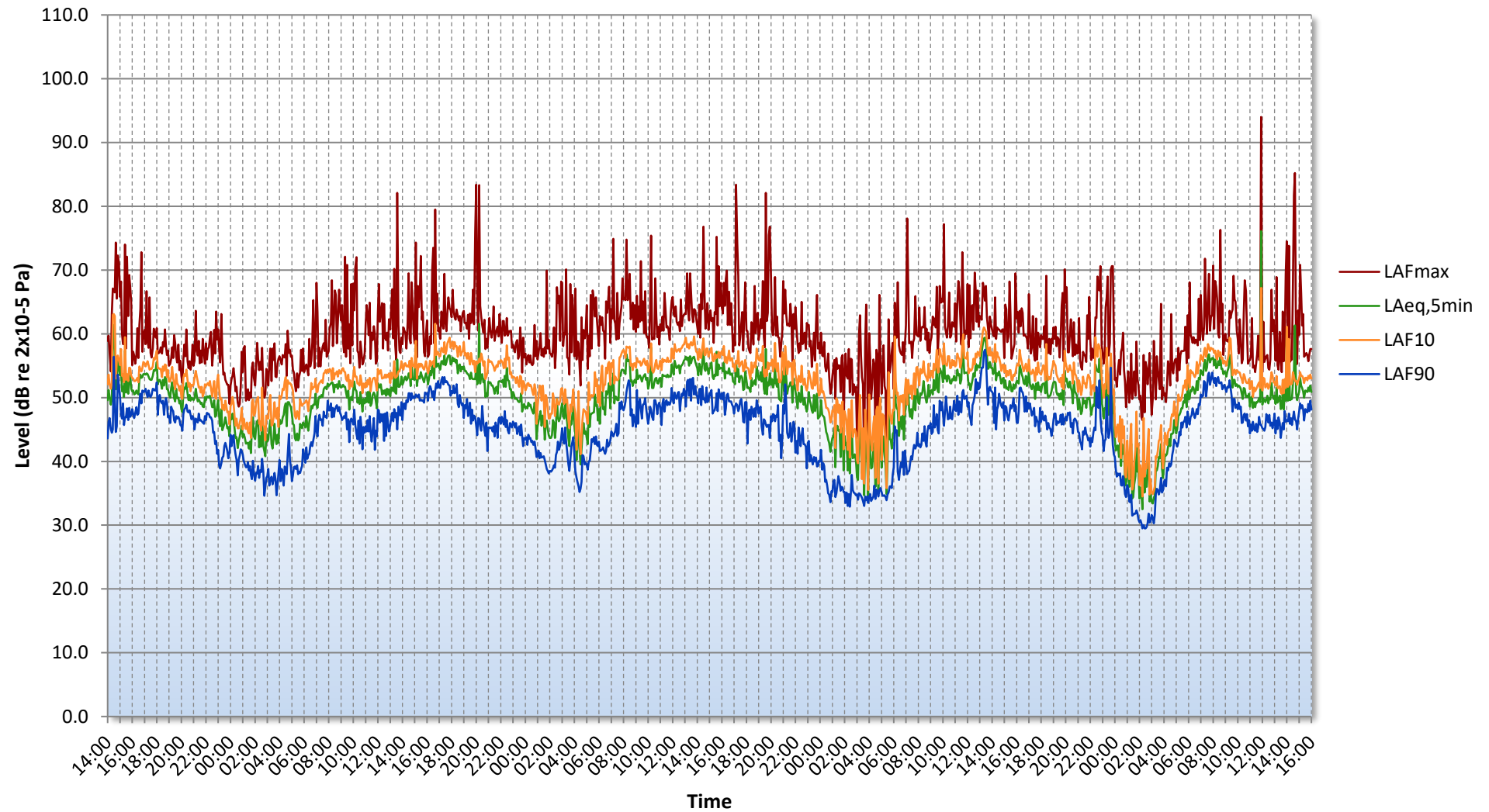


Figure 29394.TH1

GENERAL ACOUSTIC TERMINOLOGY

Decibel scale - dB

In practice, when sound intensity or sound pressure is measured, a logarithmic scale is used in which the unit is the 'decibel', dB. This is derived from the human auditory system, where the dynamic range of human hearing is so large, in the order of 10^{13} units, that only a logarithmic scale is the sensible solution for displaying such a range.

Decibel scale, 'A' weighted - dB(A)

The human ear is less sensitive at frequency extremes, below 125Hz and above 16Khz. A sound level meter models the ears variable sensitivity to sound at different frequencies. This is achieved by building a filter into the Sound Level Meter with a similar frequency response to that of the ear, an A-weighted filter where the unit is dB(A).

L_{eq}

The sound from noise sources often fluctuates widely during a given period of time. An average value can be measured, the equivalent sound pressure level L_{eq} . The L_{eq} is the equivalent sound level which would deliver the same sound energy as the actual fluctuating sound measured in the same time period.

L_{10}

This is the level exceeded for no more than 10% of the time. This parameter is often used as a "not to exceed" criterion for noise.

L_{90}

This is the level exceeded for no more than 90% of the time. This parameter is often used as a descriptor of "background noise" for environmental impact studies.

L_{max}

This is the maximum sound pressure level that has been measured over a period.

Octave Bands

In order to completely determine the composition of a sound it is necessary to determine the sound level at each frequency individually. Usually, values are stated in octave bands. The audible frequency region is divided into 11 such octave bands whose centre frequencies are defined in accordance with international standards. These centre frequencies are: 16, 31.5, 63, 125, 250, 500, 1000, 2000, 4000, 8000 and 16000 Hertz.

Environmental noise terms are defined in BS7445, *Description and Measurement of Environmental Noise*.

APPLIED ACOUSTIC TERMINOLOGY

Addition of noise from several sources

Noise from different sound sources combines to produce a sound level higher than that from any individual source. Two equally intense sound sources operating together produce a sound level which is 3dB higher than a single source and 4 sources produce a 6dB higher sound level.

Attenuation by distance

Sound which propagates from a point source in free air attenuates by 6dB for each doubling of distance from the noise source. Sound energy from line sources (e.g. stream of cars) drops off by 3dB for each doubling of distance.

Subjective impression of noise

Hearing perception is highly individualised. Sensitivity to noise also depends on frequency content, time of occurrence, duration of sound and psychological factors such as emotion and expectations. The following table is a guide to explain increases or decreases in sound levels for many scenarios.

Change in sound level (dB)	Change in perceived loudness
1	Imperceptible
3	Just barely perceptible
6	Clearly noticeable
10	About twice as loud

Transmission path(s)

The transmission path is the path the sound takes from the source to the receiver. Where multiple paths exist in parallel, the reduction in each path should be calculated and summed at the receiving point. Outdoor barriers can block transmission paths, for example traffic noise. The effectiveness of barriers is dependent on factors such as its distance from the noise source and the receiver, its height and construction.

Ground-borne vibration

In addition to airborne noise levels caused by transportation, construction, and industrial sources there is also the generation of ground-borne vibration to consider. This can lead to structure-borne noise, perceptible vibration, or in rare cases, building damage.

Sound insulation - Absorption within porous materials

Upon encountering a porous material, sound energy is absorbed. Porous materials which are intended to absorb sound are known as absorbents, and usually absorb 50 to 90% of the energy and are frequency dependent. Some are designed to absorb low frequencies, some for high frequencies and more exotic designs being able to absorb very wide ranges of frequencies. The energy is converted into both mechanical movement and heat within the material; both the stiffness and mass of panels affect the sound insulation performance.