



BRAIDEN ACOUSTICS LTD

Innovation Forum | 51 Frederick Road | Salford | Manchester | M6 6FP

NOISE IMPACT ASSESSMENT

Prepared For : Ziggy Sixx Ltd

Date : 15 Jul 2025

Site : 393 Wilmslow Road, Fallowfield

Report No. : 11323revH

1 INTRODUCTION

Braiden Acoustics has been commissioned by Ziggy Sixx Ltd to undertake an acoustic survey at the site of 393 Wilmslow Road, Fallowfield to support planning applications for

“Change of use from Class C1 (Hotel) & Class E (Commercial, Business & Service) to Class E (Gym)” and “Retrospective erection of functional training tent to rear of main gym building”

The invalid letter, dated 30th July 2024 states:

5) We will require a noise impact assessment to accompany this application.

This is a revised report after comments from the EHO:

Additional information should be provided by the applicant which sets out how amplified noise from inside the main gym will be controlled to the level suggested within the submitted acoustic report.

This is a further revised report after additional comments from the EHO:

They would need to confirm that the attenuation measures required to reduce noise from the external condensers have been installed and are sufficient to reduce noise to the levels set out in the submitted acoustic report, this will also discharge the NSE6 condition. The applicant will also need to provide a full assessment of 'worst case' noise from the functional area and the gym against the lowest background noise to confirm that noise from all activities there won't cause disamenity at any time.

In addition, a noise break-out assessment of the main gym will be undertaken.

Further comments from the EHO in June 2025:

1. The proposed acoustic enclosure attenuates noise from the condensers to 1dB below the existing background but our condition requires 5dB below. The applicant must look at attenuating the noise further and provide updated comments on this.

2. With regard to the hours of use, the original weekend opening time of 8am will apply and so the hours for both areas will be:

Mon - Fri 0700hrs to 2300hrs

Saturday 0800hrs to 2200hrs

Sunday/Bank Holidays 0800hrs to 1800hrs

Therefore this latest revision will drill down into the assessment of the noise from the large condensers and reassess where necessary.

1.1 AIM

This report shall assess the following:

- Acoustic mitigation for the noisier (larger) condenser units
- Noise break-out from the main gym
- Noise break-out from the functional tent.

Where necessary, acoustic solutions shall be recommended so that noise levels are within suitable thresholds.

2 DESCRIPTION OF SITE

The application site is detached building, part single storey and part two storey. It is the former Ram Lodge restaurant.



Figure 1
Street view of the site

2.1 SITE LOCATION AND SURROUNDING USES

The gym is located in two adjoined buildings fronting Wilmslow Road, which is a main arterial route to and from Manchester city centre.

As Figure 2 shows, there is a walkway to the building to the east of the site – the walkway and the building to the east are not part of the gym although owned by the applicant.

The site is bounded by Wilmslow Road to the north west, Brook Road to the north, Milford Road to the east and residential dwellings to the south. Nearby residential properties are denoted green in Figure 2.



Figure 2
Site location and surrounding uses showing monitoring location



2.2 EXISTING USE

The site was previously a hotel and restaurant.

2.3 PROPOSED USE

The unit is currently being used as a gym and associated facilities.

2.3.1 Ground Floor

The proposed use is shown below.

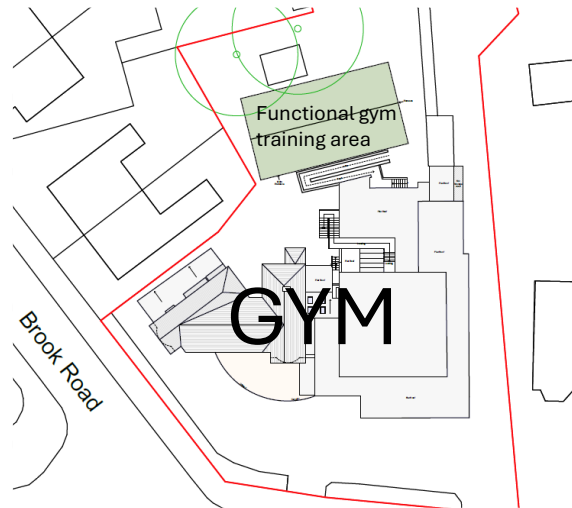


Figure 3
Proposed use

The main gym buildings have a variety of gym spaces, a sauna and changing rooms, as well as other ancillary uses.

To the rear of the main buildings is a stand-alone tent-like structure, called 'functional gym and training area' in Figure 3. It houses some fixed weight machines within its perimeter, with an empty space in the middle for stretching and the like.

2.3.2 Opening hours

The proposed opening hours are:

Weekdays	05:00 - 23:00
Saturday	08:00 - 22:00
Sunday	08:00 – 18:00

2.3.3 Building services

2.3.3.1 Condenser units

There are three condenser units:

1. 2no. air conditioning
2. 1no. fresh air recirculation.

The three units are on the southern elevation of the main gym building.





Figure 4
Condenser units' location

Details of the condenser units are shown below:

AC 1 Panasonic U-250PZH2E8

AC2 Panasonic U-250PZH2E8

Fresh Air Panasonic U-100PZ3E5

Panasonic U-250PZH2E8

Outdoor Sound Pressure dB(a) (Cool-Heat) 59 / 63 @1m¹

Panasonic U-100PZ3E5

Outdoor Sound pressure Cool / Heat (Hi) 52 / 52 @1m

The logarithmic sum of the three units, in hemispherical space, would be 66 dB.

As the condenser units are for air conditioning, then they operate only when the site is open.

3 ACOUSTIC CRITERIA AND METHODOLOGY

3.1 BS 4142

BS 4142:1999 "Method for rating industrial noise affecting mixed residential and industrial areas" [1] assesses industrial noise with regards to nearby residential dwellings. The guidance is commonly used to compare the equivalent noise from an industrial source only (*specific noise level*), L_{Aeq} , to the background noise level, L_{A90} , at the nearest sensitive receptor (NSR).

This Standard has been recently updated, BS 4142:2014 "Methods for rating and assessing industrial and commercial sound" [2]. Whereas the old standard added 5dB 'penalty' to the Specific Noise Level (SNL) if the noise source has a 'character' that can draw attention that may be described as tonal, intermittent or impulsive, the new standard gives clearer guidance on noise 'character'. Furthermore, the previous Standard gave only one 5 dB penalty whereas the new Standard may not. When added to the specific noise level it forms the *rating level*. The new Standard gives the guidance for the following types of noise character:

Where appropriate, establish a rating penalty for sound based on a subjective assessment of its characteristics. This would also be appropriate where a new source cannot be measured because it is only proposed at that time, but the characteristics of similar sources can subjectively be assessed.

¹ The noise data does not state at what distance the SPL measurement has been taken, therefore, 1m is presumed.



Correct the specific sound level if a tone, impulse or other characteristic occurs, or is expected to be present, for new or modified sound sources.

NOTE 1 The prominence of tonal or impulsive sound from a source can be masked by residual sound. In many cases the amount of masking varies as the residual sound changes in level and possibly character. The source's tonal and/or impulsive characteristics could also vary with time.

Consider the subjective prominence of the character of the specific sound at the noise-sensitive locations and the extent to which such acoustically distinguishing characteristics will attract attention.

Tonality

For sound ranging from not tonal to prominently tonal the Joint Nordic Method gives a correction of between 0 dB and +6 dB for tonality. Subjectively, this can be converted to a penalty of 2 dB for a tone which is just perceptible at the noise receptor, 4 dB where it is clearly perceptible and 6 dB where it is highly perceptible.

Impulsivity

A correction of up to +9 dB 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 3 dB for impulsivity which is just perceptible at the noise receptor, 6 dB where it is clearly perceptible and 9 dB where it is highly perceptible.

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 3 dB can be applied.

NOTE 2 Where tonal and impulsive characteristics are present in the specific sound within the same reference period then these two corrections can both be taken into account. If one feature is dominant then it might be appropriate to apply a single correction. Where both features are likely to affect perception and response, the corrections ought normally to be added in a linear fashion.

Intermittency

When the specific sound has identifiable on/off conditions, the specific sound level ought to be representative of the time period of length equal to the reference time interval which contains the greatest total amount of on time. This can necessitate measuring the specific sound over a number of shorter sampling periods that are in combination less than the reference time interval in total, and then calculating the specific sound level for the reference time interval allowing for time when the specific sound is not present. If the intermittency is readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied.

Once a penalty for noise character is added to the Specific Noise Level then this is termed the Rating Level.

The background level is then compared to the rating level. It is usual that the rating level due to the source should be below the background noise level at the nearest sensitive receptor; indeed BS 4142 states:

“The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.”

3.1.1 Council BS4142 criterion

Section 11 d) of BS 4142:2014 says

“Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact”

Therefore, minimally, the Rating Level should not exceed the Background Level to ensure any potential noise has a low or no impact.



3.2.1 Residential

The British Standard BS 8233:2014 “Guidance on sound insulation and noise reduction for buildings” gives guidance on recommended indoor ambient noise levels for residential dwellings.

Room	Criterion	$L_{Aeq,T}$	
		night	day
Bedroom	Sleeping	30	35
Dining Room/Area	Dining	--	40
Living Room	Resting	--	35

Table 1

Recommending indoor ambient noise level thresholds from anonymous noise (taken from Table 4, BS 8233:2014)

Internal levels are simply predicted by the subtraction of the estimated sound reduction index (SRI) of the building façade from the external free field noise measurements. When considering the SRI of a particular façade it is usual to only consider the glazing as this is the weakest element acoustically.

Table 2 in BS 8233:2014 give a range of target noise levels for a variety of internal spaces, such as offices. The upper limits should not be breached in order for the occupants of the space to not be disturbed. However, for open-plan offices for example, a minimum noise level can be useful to provide masking for acoustic privacy.

Table 2 ¹
Indoor ambient noise levels in spaces when they are unoccupied and privacy is also important

Objective	Typical situations	Design range $L_{Aeq,T}$ dB
Typical noise levels for acoustic privacy in shared spaces	Restaurant	40 – 55
	Open plan office	45 – 50
	Night club, public house	40 – 45
	Ballroom, banqueting hall	35 – 40
	Living room	35 – 40

NOTE See Noise control in building services [28] and BS EN ISO 3382.

Table 2

Target internal noise levels of unoccupied spaces

As Table 2 above shows, the noise levels within an open plan office should be between 45 – 50 dB(A).

4 MEASUREMENT DETAILS

There were two separate site visits for noise monitoring, one in 2024 and one in 2025.

4.1 VISIT 1

4.1.1 Background Noise Levels

Long term noise monitoring was taken at the southern boundary of the property to determine the typical background noise level of the nearby residential properties.



4.1.1.1 Monitoring overview

Personnel: John Braiden, BSc & MSc Acoustics, MIOA.

Equipment: NTi XL2 integrated real time analyser & B&K 4231 calibrator.

Weather 14- 18degC, <5m/s wind, 40-60% cloud

Time / Date: Fri 6th September-from 15:53 for over 36 hours.

The sound level meter was calibrated before after the measurements with no drift reported.

Monitoring was unmanned.

Background noise (L_{A90}), 'average' noise levels (L_{Aeq}) and maximum noise levels (L_{Amax}) were taken in 15-minute intervals.

4.1.2 Monitoring location

Monitoring location 1 (ML 1) was 2m from ground and, at least, 2m from any other surface, shown in Figure 2.



Figure 5
Background noise monitoring locataion

4.1.3 Monitoring results

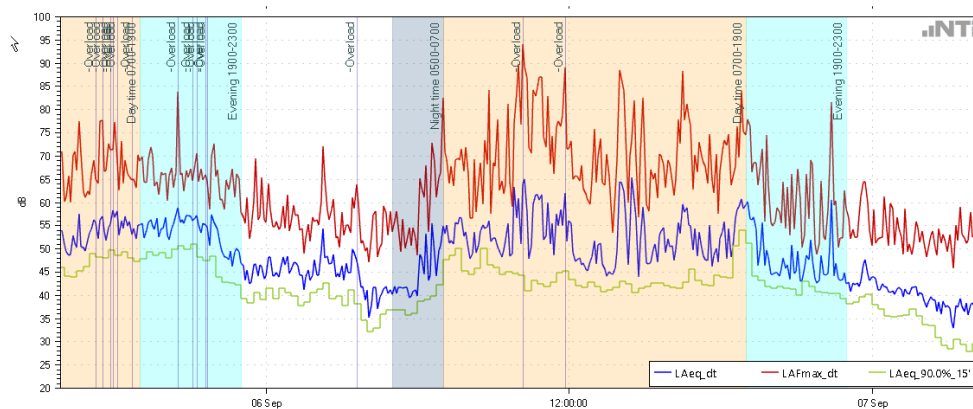


Figure 6
Time history

Noise levels in the 'rear yard' were due to staff clearing / tidying the rear yard, i.e. moving items around the yard.

Other than that, there were airplane passes and distant road traffic noise.

From approximately 5am there was bird song.

No noise from the gym or the functional training area, were detected at the monitoring location.



4.1.3.1 Typical Background Noise Levels

The opening hours of the gym are 05:00 – 23:00, therefore, the typical Background Noise Levels were split into three time periods:

1. Night time 2300² - 07:00,
2. Day time 07:00 – 19:00 and
3. Evening time 19:00 – 23:00

Typical Background Noise Levels were found using histograms.

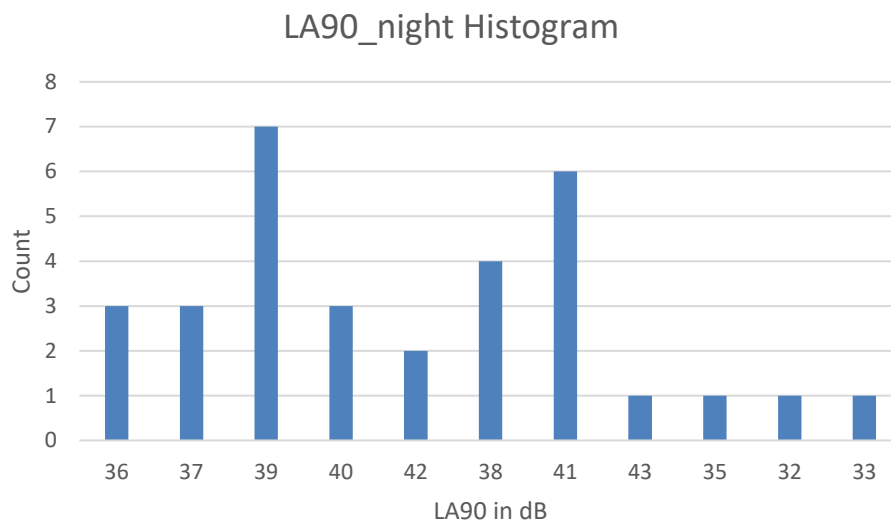


Figure 7
Histograms showing typical nighttime Background Noise Levels

Figure 7 shows that lowest typical night time (05:00 – 07:00) Background Noise Level, is

39 dB L_{A90} .

The same was done for the day time typical Background Noise Levels.

² Previously the night time Background Level was only taken between 05:00 – 07:00 which gave too few datapoints and therefore an unreliable 'typical' value.



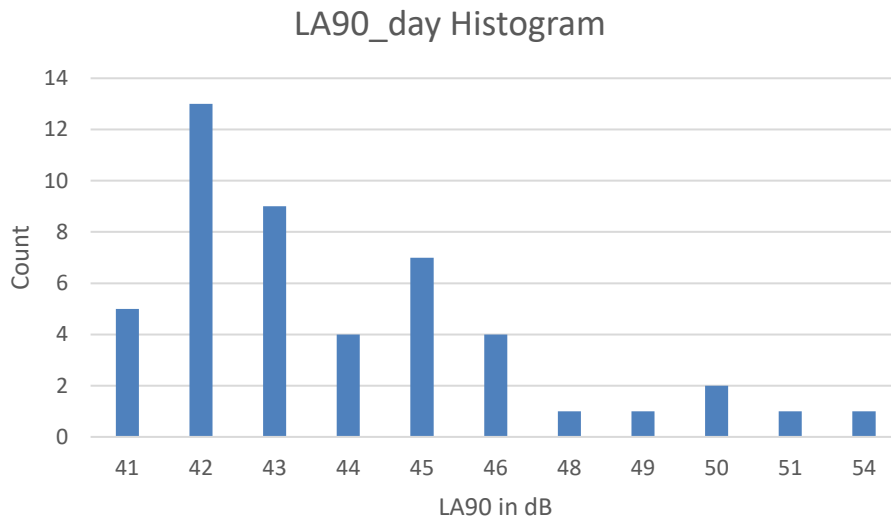


Figure 8
Histograms showing typical day time Background Noise Levels

Figure 8 shows that typical Background Noise Level during the day time period is

42 dB L_{A90} .

The same was done for the evening time typical Background Noise Levels.

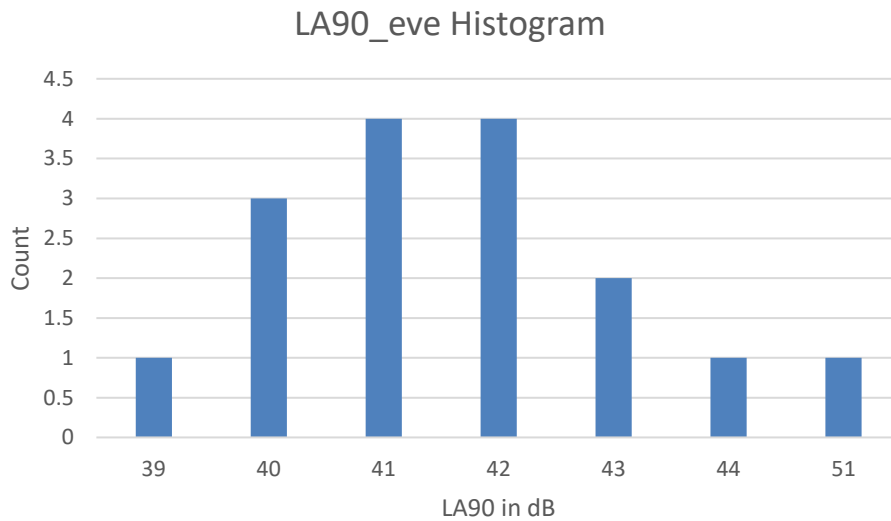


Figure 9
Histograms showing typical evening time Background Noise Levels

Figure 9 shows that typical Background Noise Level during the evening period is

41 dB L_{A90} .

4.2 EXTERNAL PLANT NOISE MEASUREMENTS

Spot measurements were made of the all the condenser units running simultaneously.



Description	Duration	Distance	Level dB(A)	Specific Noise dB(A)
Condensers OFF	1min	1m	54.9	n/a
All Condensers ON	1 min	1m	59.6	58
All Condensers ON	1 min	1m	69.1	69

Table 3
External plant measured noise levels

There were two readings of the condenser units with the second reading considerably higher in noise level. The higher noise level will be used in the assessment.

From the datasheets, the logarithmic sum of the three units is 66dB. When the reflections from the wall, that the units are attached to, are considered, then total noise level from the units would be 69 dB – as was measured.

4.3 TYPICAL INTERNAL NOISE LEVELS IN THE GYM

Within the gym, there is music playing through an amplified sound system but it is only at background noise level as most of the gym users have their own headphones.

A spot measurement was made within the reverberant sound field, i.e. away from any loudspeaker, which was:

70 dB.

4.4 VISIT 2

The second visit concentrated on noise from the Functional Tent and also at the northern boundary of the site.

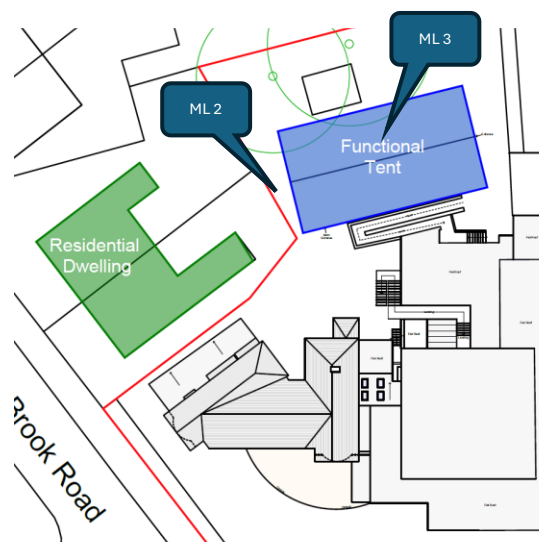


Figure 10
Site showing functional tent and nearest residential building and monitoring locations of second visit

4.4.1 Noise levels within functional tent

A microphone was placed within the functional tent over 2m from the ground and away from surfaces, as much as possible.



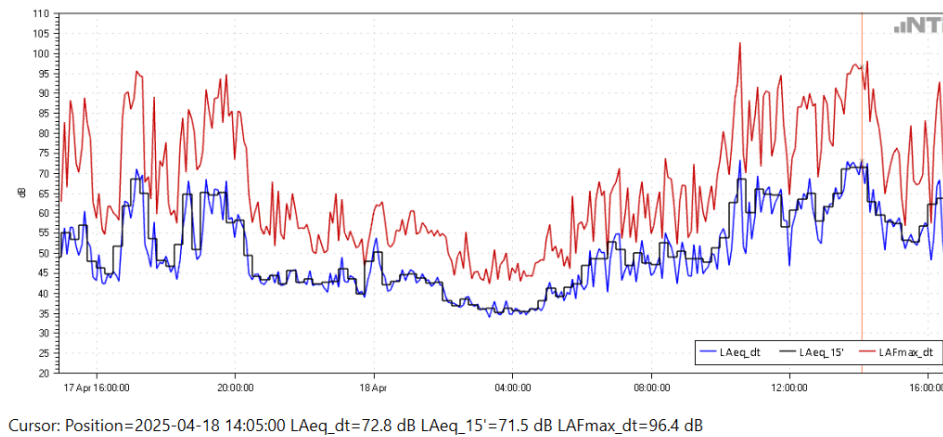


Figure 11
Noise levels within functional tent

Noise in the ‘functional tent’ was due to patrons talking and metal-on-metal sounds due to weights being knocked together.

Typical upper noise level for the functional tent was 72 dB L_{Aeq} , (15 min), which is very similar to the main gym of 70 dB.

4.4.2 Noise levels outside the functional tent

Noise levels were measured outside the functional tent on the northern boundary of the site, at the same time as within the tent, to determine noise break-out.

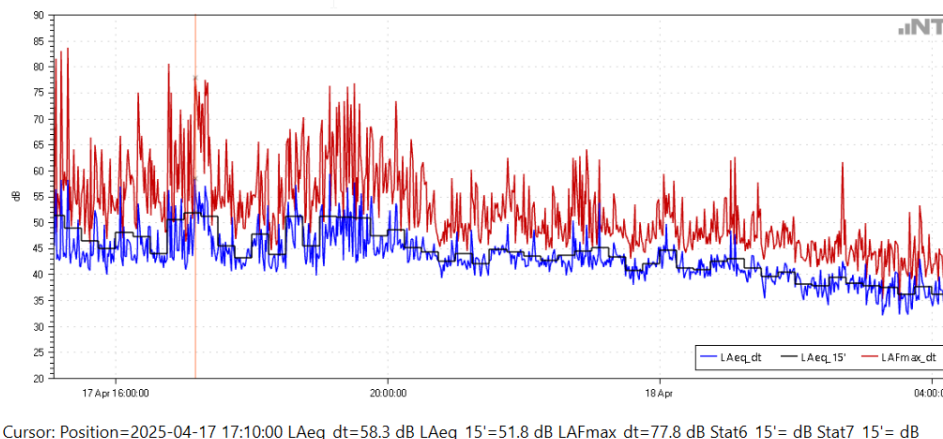


Figure 12
Noise levels outside functional tent

Unfortunately, the meter’s battery ran out after 4am, although it has a full afternoon/evening of noise monitoring.

The 15-minute L_{Aeq} at 17:00-17:15 was 52 dB. The equivalent noise level within the tent was 69 dB.

5 ACOUSTIC ASSESSMENT

The potential noise issues to be assessed are:

1. Noise from external plant
 - a. 3no. condenser units



2. Breakout noise from the main gym space
3. Noise from the external function training area

5.1 BACKGROUND NOISE LEVEL

The typical Background Noise Levels are given in Section 4.1.3.1

Night time	39 dB L_{A90}
Daytime	42 dB L_{A90}
Evening time	41 dB L_{A90}

5.2 CONDENSER UNITS

5.2.1 Acoustic Enclosure

An improved acoustic enclosure is proffered:

Sound Planning Quiet Box VI with further details in the Appendix.



Figure 13
Sound Planning Quiet Box VI

5.2.2 Distance to NSRs

The adjacent building, at 395 Wilmslow Rd, is residential. The nearest habitable window is a first floor windows on the rear elevation, some 11.6m³ from the condenser units.

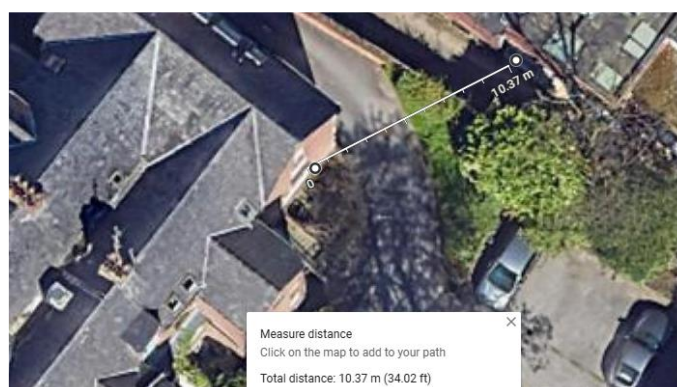


Figure 14
Horizontal distance between condenser units and nearest habitable room with direct line of sight

³ Measured with a laser measure.





Figure 15
Distance to nearest habitable window from condensers

Using a laser measure, the nearest habitable window is actually 11.6m from the condenser units.

5.2.3 BS4142 assessments

Therefore, a revised BS 4142 assessment utilised the following:

- A more accurate night-time ‘typical’ Background Noise Level
- An improved acoustics enclosure
- A revised distance to the nearest habitable window.

The full calculation has been done in octave band frequencies – see Appendix.

BS 4142 Noise Assessment Condensers	Value	dB
Total Specific Noise Level @ NSR		31
BS 4141		
Tonality	0/2/4/6	0
Impulsivity	0/3/6/9	0
Intermittency	0/3	3
Rating Noise Level		34
Background Noise Level	night	39
Rating minus Background		-5

Table 4
All Condensers BS4142 assessment

The above Table shows that the Rating Level for the Condenser units, at the nearest habitable window is 34 dB. This is 5dB below the typical night time background noise level of 39 dB L_{A90} .

****Therefore, the proposed mitigation for the condensers is sufficient****



5.3 GYM - NOISE BREAKOUT

The typical internal noise level of the main gym was measured at 70dB(A).

The gym's sound system should be limited to this value.

5.3.1 Amplified sound limiter

In order to ensure internal noise thresholds are not breached, there will need to be a limiter fitted to the main amplifier.

NB If there is more than one 'main' amplifier (i.e. different 'zones') then more than one limiter may be required.**

Such a limiter could be the SL 2000 – see Figure 16.

The limiter should have a clearly visible 'traffic light' system where it is easy to determine if noise levels are reaching the limit and can therefore be reduced before the limit is breached.



Figure 16
SL 2000 noise limiter

A separate traffic light indicator can be installed at convenient location, so that it can be viewed easily.

NB Braiden Acoustics must measure the noise levels when commissioning and calibrating such a system**

See here:

<https://www.audiovolt.co.uk/products/eagle-sl2000-noise-pollution-sound-limiter-system>

5.3.2 Noise break-out calculation

As discussed in the previous section, the upper noise level within the main gym is 70dB(A) and the audio limiter should be set to the same value.

There are windows to the front of the building, at ground floor, which are over 6m from the nearest habitable window.

A simplified noise breakout calculation uses the following equation:



$$SPL_{ext} = SPL_{int,rev} - SRI + A_{dist} - 6 \quad (1)$$

where SPL_{ext} = external open air sound pressure level (SPL), dB

$SPL_{int,rev}$ = internal reverberant SPL, dB

SRI = sound reduction index of building element, dB

S = area of building element, m²

A_{dist} = attenuation due to distance, dB

NB The single glazed window to the side of the building has now been replaced with a double-glazed unit which will have a sound reduction index of 25dB.**

BS 4142 Noise Assessment Main Gym Noise Breakout	Value	dB
Internal noise level		70
Sound Reduction Index (closed DG window)		-25
Distance to habitable window	6.5	-8
Reverb to free field correction		-6
Total Specific Noise Level @ NSR		31
BS 4141		
Tonality	0/2/4/6	0
Impulsivity	0/3/6/9	0
Intermittency	0/3	3
Rating Noise Level		34
Background Noise Level	night	39
Rating minus Background		-5

Table 5
Noise breakout calc from main gym

As the above Table shows, the Rating Level is 5dB less than the typical night time Background Noise Level, thus of 'low impact'.

NB Windows to be kept closed while the gym is in use.**

5.4 FUNCTIONAL TRAINING AREA

Noise levels were taken inside and outside of the functional tent. Rearranging Equation (1), the Sound Reduction Index of the functional tent can be determined.

Inside tent 69
Outside tent 52
In / out correction -6
SRI of tent 11dB

The distance to nearest dwelling from the functional tent is approximately 6m.



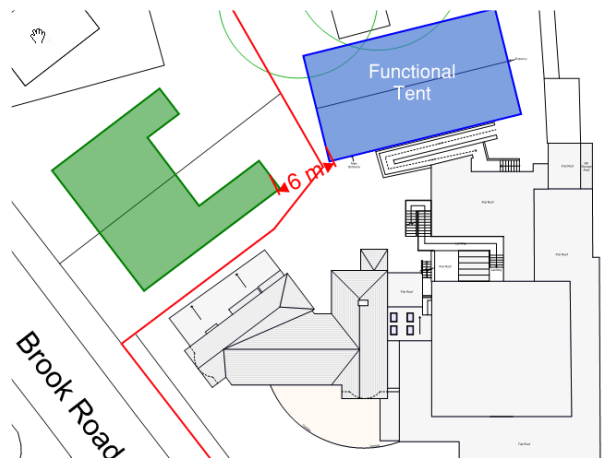


Figure 17
Distance to nearest dwelling to functional tent

Using Eqn (1) again and in the same format as Table 5, the noise breakout from the functional tent can be assessed.

Noise Break Out Functional Tent	Value	dB
Internal noise level		72
Sound Reduction Index (tent)		-11
Distance attenuation	6	-15
Reverb to free field corrections		-6
Noise level at NSR		40
BS 4141		
Tonality	0/2/4/6	0
Impulsivity	0/3/6/9	3
Intermittency	0/3	0
Rating Noise Level		43
Background Noise Level	night	39
Rating minus Background		+4

Table 6
Noise breakout calc from functional tent

Table 6 shows that Rating Level of the noise from the functional tent is 4dB ABOVE the typical night time background noise level. Section 11 of BS 4142 states:

A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.

In order to avoid the 'adverse impact', the functional tent should not be used during the night time period, i.e. before 7am or after 11pm.

Operating during the day would be the Rating – Background would then be:

- +1 daytime
- +2 evening

And so would be closer to 'low impact' (depending on context).



6 CONCLUSION

An acoustic survey has taken place at 393 Wilmslow Road, Fallowfield to determine noise break levels from the proposed site.

The assessment revealed the following external plant:

- 2no. Large condenser
- 1no. Small condenser

The BS 4142 “Methods for rating and assessing industrial and commercial sound” shows that Rating Level is above the typical Background Level for all external plant.

The following is recommended for the larger, more noisy, condenser units:

- Acoustic enclosure – Sound Planning Quiet Box VI

In order to mitigate noise break-out from the gym, the following is recommended:

- All doors and windows closed when the gym is in operation
 - The single glazed window to the side has now been replaced with a double glazed unit
- Eagle SL2000 Noise Pollution Sound Limiter System to be correctly fitted and limited to 70dB(A).

Noise breakout from the functional tent has been shown to be “an indication of an adverse impact. To mitigate this, the following is recommended:

- Functional tent to be only used during daytime hours, i.e. 07:00 – 23:00
- No amplified sound to be played in the functional tent.

7 REFERENCES

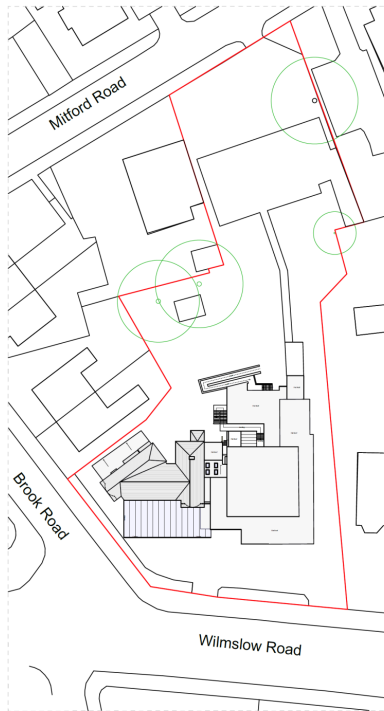
- [1] BS 4142: 1997
Method for Rating industrial noise affecting mixed residential and industrial areas
British Standards Institute, 1997.
- [2] BS 4142: 2014
Methods for rating and assessing industrial and commercial sound
British Standards Institute, 2014.



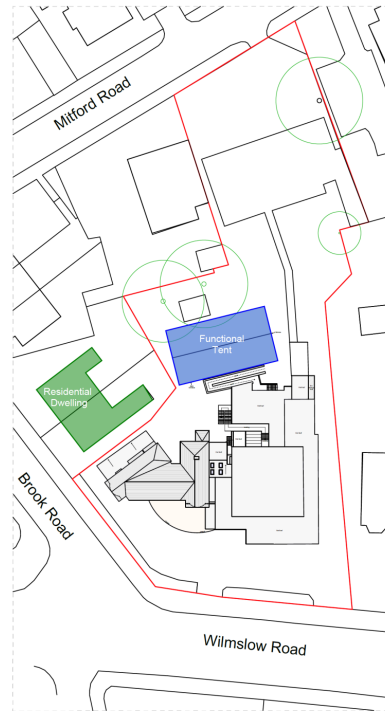
Appendix



A1 PROPOSED USE



EXISTING GA SITE PLAN



PROPOSED GA SITE PLAN

notes
This drawing is subject to a detailed building and site survey.
The drawing has been drafted in accordance with the client's design requirements.
All areas are approximate and are subject to a detailed building and site survey and further design development.
All dimensions should be checked prior to commencement of construction or site. Measurements should not be taken off the drawing.

All dimensions shown are in millimetres (mm).



PL0 Planning Issue 23.07.24
revisions
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D - design PL - planning PT - pre-tender
T - tender P - primary R - record
C - construction R - record

MUSCLE MANOR

CHANGE OF USE
393 WILMSLOW ROAD,
MANCHESTER, M20 4WA

EXISTING & PROPOSED GA
SITE PLAN

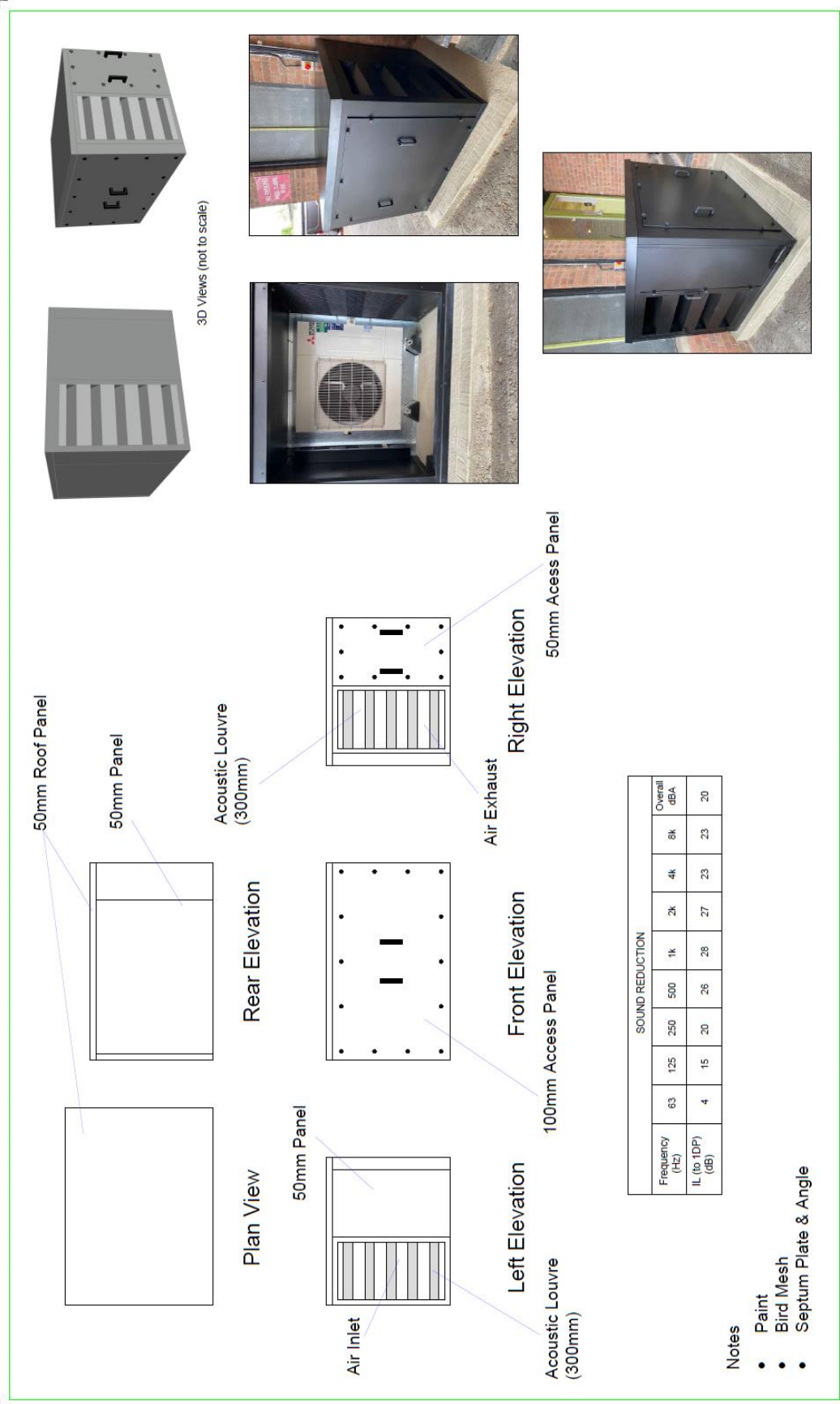
scale 1:500 @ A3 date 23.07.24 drawn MB checked AC

job no 24-1271 (01)001 PL0

Drawing measurements shall not be obtained by scaling. Verify all areas prior to construction. Immediately report any discrepancies on this drawing to Architects. This drawing shall be read in conjunction with associated specifications and related consultant's documents.



A2 ACOUSTIC ENCLOSURE



Rev	Amendment	Date	Project: Sound Enclosure	Scale: NTS @A4	Date: 23/06/21
				Drawn: B. Walker	
Notes				Drawing No: Quiet Box VI-1	
No scaling permitted from this drawing. All dimensions shown to be verified prior to construction / manufacture.				Title: Quiet Box VI	



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A3 OCTAVE BAND CALCULATION

Muscle Manor, 393 Wilmslow Rd		BS 4142	Large Condenser	Octave band centre frequency							
Item	Quantity	Description	Details	63	125	250	500	1000	2000	4000	Total level
r	1 m	Sound Pressure Level @ 1m (measured)	Large Condenser, Lp @ 1 m	79.1	79.1	69.6	66.1	63.0	58.1	53.3	82.5
		Sound Power Level of unit	SPL data used	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.5
SRI		Louvre / Enclosure attenuation	Sound Planning Quietbox VI	-4	-15	-20	-26	-28	-27	-23	
		A weighting	yes	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	
		Sound @ 1m		48.9	48.0	41.0	36.9	35.0	32.3	31.3	52.2
		Directivity	No directivity	0	0	0	0	0	0	0	
	Q 0	No. of reflective surfaces	none	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
R	11.6 m	Distance Attenuation	20*log10(R)	-21.29	-21.29	-21.29	-21.29	-21.29	-21.29	-21.29	
		Air absorption	15°C; 80% humidity	0.00	0.00	-0.01	-0.03	-0.05	-0.10	-0.27	
		Numerical correction	none	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	δ 0	Barrier	no	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
		SPL(A) at NSR	L _{p,NSR}	27.6	26.7	19.7	15.6	13.7	10.9	9.7	30.9 dB

