



BRAIDEN ACOUSTICS LTD

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

NOISE IMPACT ASSESSMENT

Prepared For : RALA Architects

Date : 4 Jul 2024

Site : Bowlee Driving Range, Bowlee, Middleton

Report No. : 11286

1 INTRODUCTION

Braiden Acoustics has been commissioned by RALA Architects to undertake an initial acoustic survey at the site of Bowlee Driving Range, Bowlee, Middleton in order to support a planning application for additional driving range bays and adventure golf area.

1.1 AIM

This initial report shall determine the potential noise sources and receivers and determine noise limits for said noise sources, according to relevant standards and guidance.

2 DESCRIPTION OF SITE

The site is a golf driving range with bays to the western part of the site., behind which is a car park.



Figure 1
Ariel view of site

2.1 SITE LOCATION AND SURROUNDING USES

As Figure 1 shows, there are fields to the south of the site. To the west, there is Greater Manchester Construction Training with Bowlee Nursery directly to the north of that. To the north west, is the former Tapios bar / restaurant (342 Heywood Old Rd) which has planning permission to become apartments. The proposed residential dwellings (as well as an existing residential dwelling at 344 Heywood Old Road) will be approximately 100m north west of the golf range site boundary. Directly to the north of the golf range is a fitness club with car park. To the north east is an area of hardstanding, potentially where buildings once stood – the land is now used for weekly car boot sales. To the east is an area of dense vegetation with residential dwellings further to the east and south east.



Figure 2
Site location and surround uses

2.1.1 Nearest sensitive receivers

There are three locations of nearby residential dwellings:

1. 296 – 310 Heywood Old Road
2. Tapios 342 & 344 Heywood Old Road
3. Rowrah Close and roads off it.

2.2 PROPOSED USE

The main improvement to the golf range is an additional tier to form 51 bays in total.

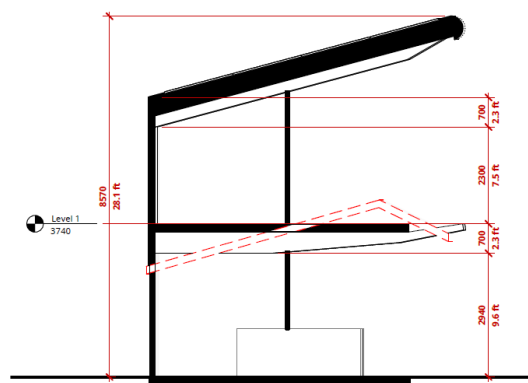


Figure 3
Section showing two tier golf range

As well as an additional tier, there will be an adventure golf area to the north western part of the site.





Figure 4
Proposed use for north western part of the site

The adventure golf area is shown in Figure 4. There will be entertainment music at the adventure golf facility to create ambiance.

Directly to the west of the adventure golf area will be the following:

Ground Floor

- Entrance / shop
- Bar
- Bar store
- Toilets
- Office
- Workshop
- Ball room.

First floor

1. Indoor golf bays x 4.

2.2.1 Opening hours

The current opening hours are:

Saturday	9:30 am–6:30 pm
Sunday	9:30 am–5 pm
Monday	11 am–8:30 pm
Tuesday	11 am–8:30 pm
Wednesday	11 am–8:30 pm
Thursday	11 am–8:30 pm
Friday	11 am–8:30 pm

The proposed hours will remain the same.



2.2.2 Building services

At the time of writing, only one piece of external plant is known and that is an inverter for a solar array: Solis 5g Pro 110kw 3ph Inverter.

The inverter will be located at the southern end of the driving bays:



Figure 5
Inverter location

The noise level of the inverter is not yet known.



Figure 6
Inverter

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.

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:

Obtain an initial estimate of the impact of the specific sound by subtracting the measured background sound level from the rating level.

a) Typically, the greater this difference, the greater the magnitude of the impact.

b) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.

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



d) 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.

3.2 BS 8233: 2014

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.

3.3 COUNCIL CRITERIA

3.3.1 Industrial noise

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

4 MEASUREMENT DETAILS

A site visit measured external background noise levels.

4.1 BACKGROUND NOISE MONITORING

In order to assess the noise levels, background noise levels have been taken at a location near to the residential properties to the east of the site.

Background noise measurements were made in line with Section 8 – Background sound level, of BS4142:2014.

4.1.1 Measurement Time Interval, T_m

The Measurement Time Interval, T_m is given (in BS4142:2014 Section 3.6) as:

total time over which measurements are taken

For measuring background noise levels, Section 8.1.3 of BS 4142:2014 states:



“Ensure that the measurement time interval is sufficient to obtain a representative value of the background sound level for the period of interest. This should comprise continuous measurements of normally not less than 15 min intervals, which can be contiguous or disaggregated.”

A site visit measured external background noise levels.

4.1.2 Monitoring details

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

Weather: 16 - 21- °C; <5ms⁻¹ wind; ~40 - 60% cloud; no precipitation.

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

Date: Sunday 19th May 2024

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

Monitoring was unmanned.

4.1.3 Monitoring location

Background noise monitoring was taken at the quietest residential receptor (south of east of the boundary of the site), as a worst-case methodology; the location of which is shown by ‘ML’ in Figure 7.



Figure 7
Background Noise monitoring location

The monitoring location was representative of the nearest sensitive receptor.

The microphone was 1.5m from local ground and in a free field position.

4.1.4 Monitoring times

Monitoring took place late on a Sunday morning and into the night when background noise levels would be relatively quiet.



4.1.5 Monitoring results

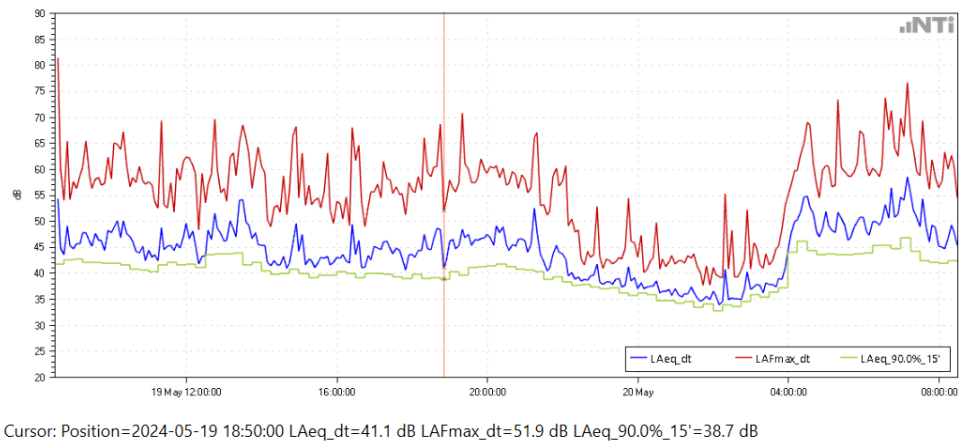


Figure 8
Measured noise levels

The lowest 15-minute Background Noise Level for the day time period (i.e. when the golf range would be open) was 38.7 dB L_{A90} .

5 ACOUSTIC ASSESSMENT

There are three potential noise sources:

1. Noise from the golf range due to the impact and flight / landing of golf balls
2. Noise from the inverter for the solar panels
3. Noise from the Adventure Golf.

5.1 NOISE FROM GOLF RANGE

At the monitoring location, as denoted by ML in Figure 7, there was no evidence of noise from the golf range.

Furthermore, spot noise measurements were taken at the rear of the residential properties on Heywood Old Road and noise from the golf range could not be detected, primarily due to shielding of the golf range building itself, distance and the relatively elevated Background Noise due to noise from Heywood Old Road.

Further assessment of golf range noise may be required.

5.2 NOISE FROM EXTERNAL PLANT

The Rating Level (as per BS 4142) should not exceed the Background Level of 37 dB at any of the Nearest Sensitive Receptors; which is likely to be Residential location 1, as denoted in Figure 2.

5.3 NOISE FROM ADVENTURE GOLF

There may be a sound system associated with the Adventure Golf area to create ambience. These noise levels are expected not be excessive. However, as with external plant, the Rating Level of noise (e.g. entertainment music) should not exceed 37 dB at the nearest sensitive receptor. In this case, the flats proposed at the site of the former Tapio restaurant and the existing nearby residential dwelling.



6 CONCLUSION

An initial baseline acoustic survey has taken place at Bowlee Driving Range, Bowlee, Middleton to determine potential noise sources and noise limits at the nearest noise sensitive receptors.

The potential noise sources are:

1. Noise from external plant
2. Noise from the golf range
3. Noise from the Adventure Golf area, in particular, entertainment music noise.

Three residential areas have been determined to the Nearest Sensitive Receptors (NSRs):

1. 296 – 310 Heywood Old Road
2. 342 (Tapios) & 344 Heywood Old Road
3. Rowrah Close and roads off it.

The Rating Level of 37 dB must not be exceeded at any Noise Sensitive Receptors, for any noise sources associated with the proposed development.

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 DRAWINGS



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