

Arley Avenue, Bury, Car Park Noise Impact Assessment

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This report has been prepared based upon a scope of works and associated resources agreed between the client and Philip Dunbavin Acoustics Ltd (PDA). This report has been prepared with all reasonable skill, care and diligence and has been based upon the interpretation of data collected. This has been accepted in good faith as being accurate and valid at the time of the collection. This report has been based solely on the specific design assumptions and criteria stated herein.



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1.0 SUMMARY

At the request of Hive Homes LLP, PDA Ltd has carried out a noise impact assessment for the proposed car park on the land off Arley Avenue, Bury, BL9 5HE.

Noise egress from the proposed car park to the nearest residential receivers has been modelled to the nearest existing residential facades.

The suitability of the site for a car park in regards to noise has been assessed against the recommended design criteria of WHO Guidelines for Community Noise 1999 & BS 8233:2014.

It is concluded that the use of the car park will have a negligible impact on the nearest residential receivers, and therefore an acoustic fence surrounding the site is deemed unnecessary. It is further noted that the car park is for use only by match officials on match days for the football club that use the Seedfield Centre pitches at the weekend, the car park will otherwise remain closed.

All results assessment methods and results are presented in this report.

2.0 SITE DESCRIPTION

The site is located to land off Arley Avenue, Bury, BL9 5HE. Football pitches are located to the Seedfield site circa 40m south of the proposed development. The proposed development includes for the repurposing of the existing land into a car park for match officials to use during match days. The site is predominantly surrounded by existing residential properties.

It is understood that the car park will be used once a week by match officials during games and at all other times the car park will be closed (not in use).

An overview of the proposed site is shown in Figures 1 and 2 below:



Figure 1. Existing Site (site boundary highlighted blue, indicative)

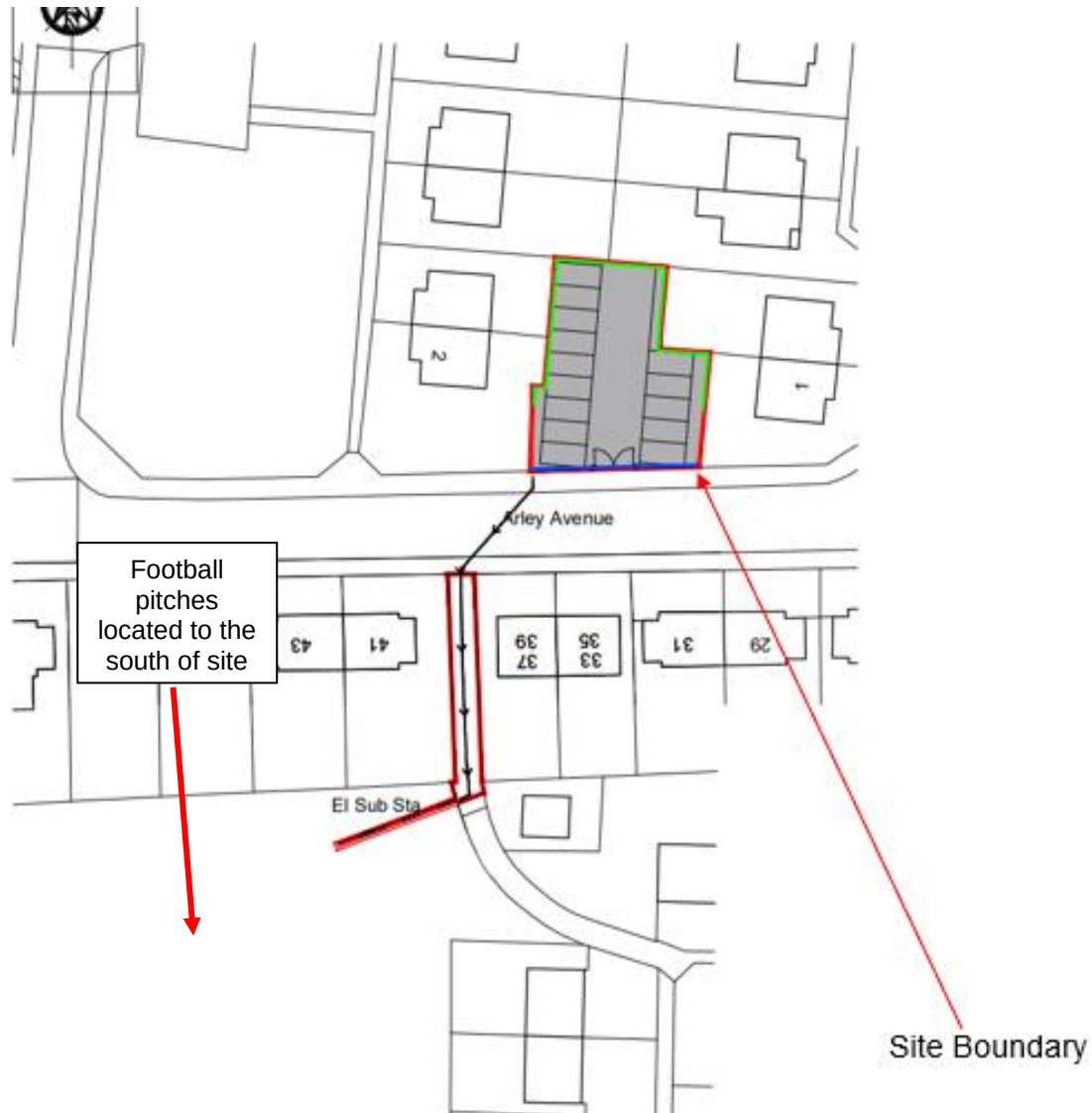


Figure 2. Proposed Site Layout

3.0 ASSESSMENT CRITERIA

3.1 Planning Condition 3

Planning Condition 3 for the proposed development reads as follows:

Condition Number 3 - The proposal hereby approved shall include acoustic fencing adjacent to the rear of the properties along Copse Drive and Spinney Drive in accordance with an acoustic attenuation scheme to be submitted to and approved in writing by the Local Planning Authority before the development commences. The acoustic attenuation scheme approved shall be implemented in full before use of the car parks first commences.

However it is understood that following further correspondence with the LPA, if it can be demonstrated that noise egress from the car park is likely to cause minimal or no disturbance at the nearest residential receivers, then an acoustic fence to the car park perimeter may not be necessary.

3.2 BS 8233:2014 Guidance on Sound Insulation and Noise reduction for Buildings

Dwelling houses, flats and rooms in residential use

British Standard 8233:2014, Guidance on Sound Insulation and noise reduction for buildings, gives guidance on internal noise levels within dwellings, flats and rooms in residential use when unoccupied. The following criteria are for Living and Dining Rooms for daytime use and Bedrooms for night time.

Table 1. BS 8233 Recommended Indoor Ambient Noise Levels

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living room	35 $L_{Aeq,16hour}$	—
Dining	Dining room/area	40 $L_{Aeq,16hour}$	—
Sleeping (daytime resting)	Bedrooms	35 $L_{Aeq,16hour}$	30 $L_{Aeq,8hour}$

It should however be stressed that the above criterion relates to steady noise, in this case from road traffic etc., excluding unusual noise events departing from the typical noise character of the area.

With regard to gardens and external areas, BS 8233:2014 (Section 7.7.3.2) gives the following advice:

For traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50dB $L_{Aeq,T}$, with an upper guideline value of 55dB $L_{Aeq,T}$ which would be acceptable in noisier environments. However, it is also recognized that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited.

3.3 WHO Guidelines for Community Noise

In 1999, the WHO (World Health Organisation) published Guidelines for Community Noise, stating the following noise levels are applicable to residential dwellings.

Table 2. WHO Guidelines for Community Noise Criteria

Specific Environment	Critical Health Effect(s)	L _{Aeq} dB	Time Base (hours) *
Dwelling, indoors	Speech intelligibility & moderate annoyance, daytime & evening	35	16
Inside bedrooms	Sleep disturbance, night-time	30	8

* Typically taken to be daytime/evening - 07:00 – 23:00 hours and night time 23:00 – 07:00 hours.

In addition to the above continuous equivalent noise levels, WHO guidelines indicates that exceedances of 45 dB L_{Amax} for single sound events should be limited to no more than 10 – 15 times per night, when measured with a 'fast' time weighting.

4.0 SURVEY DETAILS AND RESULTS

4.1 Noise Survey Details

PDA have previously assessed a new residential development (application ref 69079) within a short distance to the proposed car park as detailed in PDA report ref. J004383/7028/TD/01, dated 19th April 2023. As part of the assessment for the residential site, a noise survey was conducted over a circa 24-hour period. A summary of the noise survey results is provided below.

The location for the measurement positions utilised for the noise survey are illustrated in Figure 3 below.



Figure 3. Noise Survey Monitoring Positions

Table 3. Summary of noise survey results

Monitoring Position	$L_{Aeq,T}$ Day dBA	$L_{Aeq,T}$ Night dBA	L_{Amax} Range Night dBA
LT1	52	48	52-78
ST1	50	-	-

Given the relatively close proximity of the above noise measurement positions to the proposed car park we would estimate that the existing ambient noise climate during the day time at the residential receivers closest to the car park is 50-52dBA. It may be noted that this estimate is considered conservative as we would expect the ambient noise climate at the residential receivers adjacent to the car park to exceed the noise levels measured at LT1 and STL, as these receivers are closer to the road (ie Arley Avenue).

5.0 NOISE EGRESS FROM CAR PARK

We have assessed vehicle movements within the proposed car park in accordance with the 6th revised edition of the parking lot study 'Recommendations for the Calculation of Sound Emissions of Parking Areas, Motorcar Centers and Bus Stations as well as of Multi-Storey Car Parks and Underground Car Parks' published by the Bavarian Landesamt für Umwelt (Bavarian Office for the Environment), as included within SoundPlan noise modelling software.

The car park noise is calculated based upon the number of spaces within the car park, the type of use, and the number of expected movements within an hour period. It is understood that there are 14 car park spaces. It is understood that the car park will be used once a week by match officials during games and at all over times the car park will be closed (not in use). Therefore we have deduced that at most there will be 14 movements within the car park in an hour period during which match officials arrive, and later there will be a further 14 movements within the car park in an hour period during which match officials leave. Therefore noise from the car park use has been modelled based on 1 movement per hour per space

An overview of the SoundPlan model is provided below, with calculations at the worst affected receivers.

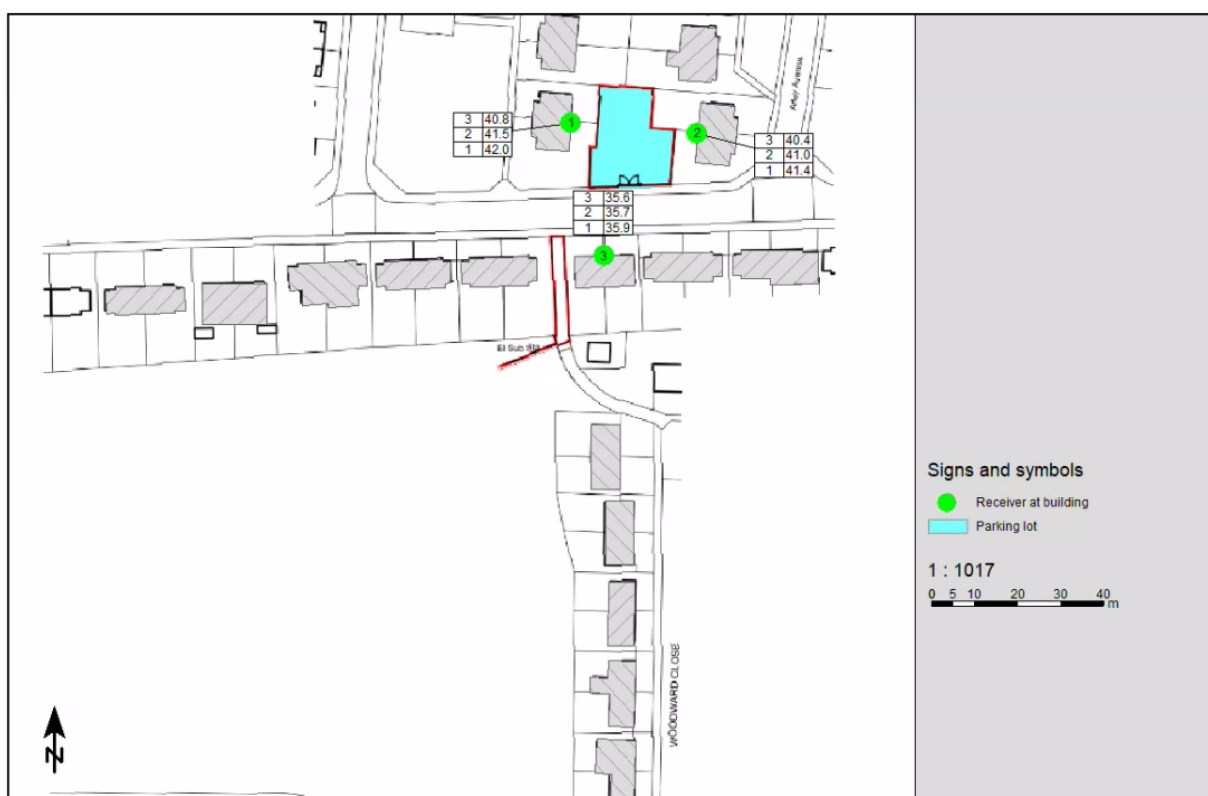


Figure 4. Car Park Noise Egress, SoundPlan Overview

It may be noted that the noise model does not include for any acoustic fencing around the car park. The $L_{AeqT,1hr}$ has been calculated as 42dB at the worst affected receiver. This is below the estimated existing

residual noise climate (50-52dBA), as evaluated from the day-time noise survey as detailed in Section 4. Allowing for the attenuation provided by a partially open window (circa 12dB sound reduction), the equivalent internal noise level within the nearest bedroom would be expected to be 28-30dBA. This meets the internal noise level criteria for bedroom spaces (35 dBA during the day time) as recommended by BS 8233 and WHO 1999. A closed window will further reduce noise egress from the car park to the internal spaces of the nearest residential property. All residential gardens of the nearest receivers will not exceed the desired 50dBA or 55 dBA limit criteria for external amenity spaces (as detailed in BS 8233 and WHO 1999 guidelines) as a result of noise egress from the car park.

Further to the above it should be noted that the car park will only be used once a week for a brief period while match officials arrive and then leave after the match. We would therefore consider that this would further reduce any potential disturbance as a result of noise egress from the car park.

Therefore it is concluded that the use of the car park will have a negligible impact on the nearest residential receivers, and therefore an acoustic fence surrounding the site is deemed unnecessary.

6.0 CONCLUSION

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APPENDIX I – DEFINITION OF ACOUSTIC TERMS

The decibel

This is the basic unit of noise, denoted dB.

A Weighting

This is a weighting process which simulates the human ear's different sensitivity at different frequencies. A weighting can be shown two typical ways, 50 dB(A) L_{eq} or 50 dB L_{Aeq} . Both mean the same thing. (See below for a definition of L_{eq}). The dB(A) level can be regarded as the overall level perceived by human beings.

L_{eq} and $L_{eq(s)}$

This is the equivalent continuous noise level which contains the same acoustic energy as the actual time-varying sound. In other words it is a kind of average noise level. It is denoted dB L_{eq} or, for A-weighted figures dB(A) L_{eq} or dB L_{Aeq} . It can also be expressed in terms of frequency analysis (see later). $L_{eq(s)}$ is the sample L_{eq} level.

L_n

This is the level exceeded for n% of the time. It is denoted dB L_n or, for A-weighted figures dB(A) L_n or dB L_{An} . It can be expressed in terms of frequency analysis (see later). L_{90} is the level exceeded for 90% of the time and is a measure of the lowest level typically reached. L_{10} is the level exceeded for 10% of the time and is the highest level typically reached. L_{50} is the level exceeded for 50% of the time and, mathematically, it is the median.

L_{max}

This is the maximum level reached during a measurement period. The "time constant", or the ability of the equipment to respond to impulses is usually expressed along with it, e.g. "Fast", "Slow", etc. It is denoted dB L_{max} or, for A-weighted figures dB(A) L_{max} , dB L_{Amax} , etc. It can also be expressed in terms of frequency analysis.

Frequency Analysis

Whereas dB(A) gives a very useful overall figure, it has its limitations in that it cannot be used to model or predict the effect of noise control and mitigation as this nearly always has radically different performance at different frequencies.

Frequency analysis expresses an overall noise level at each frequency or band of frequencies in the audible range. Octave band analysis divides the audible range into 10 bands from 31.5 Hz to 16 kHz and the noise level in each band can be expressed in any form e.g. L_{eq} , L_{90} , L_{max} etc. One third octave band analysis uses 30 bands.

Narrow band analysis takes the process to resolutions of less than 1 Hz. This is useful for identifying the existence of tones (whines, hums, etc.) and in pin-pointing the sources.