ACOUSTIC DESIGN TECHNOLOGY
Noise and Vibration Consultants

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PARKSIDE SPORTS FACILITY

ENVIRONMENTAL NOISE IMPACT ASSESSMENT

ACOUSTIC CONSULTANCY REPORT ADT 3519/ENIA

Revision	Date	Issued By	Checked by	Revision Notes
-	21 August 2023	Joe Mosley	Chris Middleton	first issue
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1.0 SUMMARY

The proposal is to redevelop the site to construct a sports pitch and a community building, with associated access, landscaping and car parking, as indicated on the planning application drawings.

The assessment methodology has been discussed with Emily Convey McGovern, environmental health officer at Barnsley Metropolitan Borough Council.

Acoustic Design Technology Limited have undertaken an environmental noise survey to determine the currently prevailing noise levels representative of surrounding noise sensitive areas.

The predicted cumulative rating level from the proposed plant installations is below the typical background level during the proposed hours of plant operation. According to BS 4142:2014, this is "... an indication of the specific sound source having a low impact, depending on the context". Assessment of the context has found no need to adjust the initial assessment of impact.

The noise levels emanating from the community building during evening functions were predicted using a combination of library noise data and manufacturer's sound reduction data. Assuming that windows and doors are closed during functions involving amplified music, the predicted noise levels from the building are at least 5 dB below the prevailing background level at all noise sensitive properties, indicating a low impact.

The noise levels from the sports pitch were assessed against Sport England guidance using the LAeq,1hour parameter. While the predicted noise levels from the pitch were above the Sport England Limit by up to 3 dB, the guidance acknowledges that a slight exceedance of the 50 dB limit may be acceptable.

The noise levels from the sports pitch were also assessed using the LAmax parameter. The predicted noise levels from the pitch were generally below the council's requested limit, although it was exceeded by 2 dB at the closest residential property. It is noted that the highest levels would only occur when a noise event (voices or ball impacts) occurs close to the property, and that the predicted L_{Amax} levels are generally below the measured L_{Amax} levels from existing sources, indicating a potential lower impact.

Analysis of the noise generated by people leaving the site revealed that the noise impact on surrounding noise sensitive areas should be below the BS 8233 limits when people are leaving the sports pitch but slightly above the BS 8233 limits when people are leaving the community building after an evening function. Although there is a slight excess above the limit after the evening functions, it is noted that these will occur relatively infrequently and the function room will not necessarily always be at maximum capacity, as assumed in the modelling.

2.0 BASIS OF ASSESSMENT

2.1 Site Description

The site is located in Hoyland, at the junction between Parkside Road and Sheffield Road, west of Hoyland town centre. The site is currently an open field, surrounded by two storey houses on Parkside Road to the north west and on Stead Lane/Warren View to the north east. The site is bounded to the south west by the Sheffield Road and the newly constructed Olympus Way. Beyond the south eastern boundary is another open field.

The properties in the immediate vicinity are mainly two storey houses, although there are a number of large distribution hubs located beyond Olympus Way to the west. Other than Olympus Way, the closest main road/motorway is the M1, located beyond the distribution hubs, approximately 700m south west of the site boundary.

2.2 Proposed Development

The proposal is to redevelop the site to create a sports pitch, a community building, and an archery range, all with associated access, car parking and landscaping as indicated on the application drawings. Proposed opening times for the sports pitch and community building are shown below:

Day	Sports Pitch	Community Building
Monday to Thursday	09:00 to 22:00	08:30 to 22:00
Friday	09:00 to 22:00	08:30 to 00:00*
Saturday	09:00 to 17:00	08:30 to 00:00*
Sunday	09:00 to 17:00	08:30 to 17:00

*Note that the building would only close at midnight when a function is happening. Typically, the building would close at 22:00, at the same time as the sports pitch.

2.3 Planning Policy

The National Planning Policy Framework (NPPF) sets out the general terms of reference for sustainable development, including noise. Section 185 of the July 2021 edition states that:

> *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 impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life[65];*
>
> *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.*

For this development the key principle to be applied from the NPPF is to protect existing residents from noise generated by the development.

The Noise Policy Statement for England (NPSE) published in March 2010 establishes the No Observed Effect Level (NOEL), Lowest Observed Adverse Effect Level (LOAEL) and Significant Observed Adverse Effect Level (SOAEL), although these are not linked to objective criteria, as Section 2.22 of the NPSE states:

It is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times.

The Ministry of Housing, Communities and Local Government guidance on planning and noise as of July 2019 includes a noise exposure hierarchy table to help determine the NOEL, NOAEL and SOAEL. This is provided in Appendix A.

2.4 Assessment Criteria

The assessment scope and methodology has been discussed with Emily Convey McGovern from Barnsley Metropolitan Borough Council.

It was agreed that, for plant noise, a BS 4142 rating level at or below the prevailing background level should be indicative of a "low impact" at the nearest noise sensitive properties. For noise emanating from the community building during Friday/Saturday night functions, it was considered appropriate to control the $L_{Aeq,1hour}$ to at least 5 dB below the background level.

It was agreed that sports pitch noise should be assessed using the Sport England criterion of <= 50 dB $L_{Aeq,1hour}$ at the nearest residential properties. This criterion is found in the Sport England design note 'Artificial Grass Pitch (AGP) Acoustics – Planning Implications' and is drawn from the WHO "Guidelines for Community Noise" limit of <= 50 dB $L_{Aeq,16hours}$.

An assessment of L_{Amax} levels from the sports pitches was also requested. As the sports pitch noise will only occur during the day, an internal limit of <= 50 dB L_{Amax} was considered appropriate. This is a 5 dB relaxation on the WHO/ProPG limit of 45 dB, which applies during the night and is intended to prevent sleep disturbance.

An assessment of noise coming from people and vehicles leaving the site was also requested. The loudest noise levels from this type of noise are predicted to occur in the 30 minutes after the football pitches close and in the 30 minutes after a function ends. Noise from these sources is to be assessed against the ambient noise limits for bedrooms in BS 8233. These are: 35 dB $L_{Aeq,16hours}$ during the day and 30 dB $L_{Aeq,8hours}$ during the night.

It is generally accepted that a façade with windows partially open for ventilation provides a noise reduction of around 15 dB to the incident $L_{Aeq,T}$. In the table below, all of the criteria which refer to internal noise levels have been corrected by +15 dB such that compliance with the criteria can be assessed by reference to external noise levels.

Noise Source	Parameter	Criteria	Most Sensitive Period
Plant Noise	$L_{Ar,T}$	<= Prevailing $L_{A90,T}$	Any Day 02:00-05:00
Community Building	$L_{Aeq,1hour}$	<= Prevailing $L_{A90,T}$–5dB	Fri/Sat 23:00-00:00
Sports Pitch	$L_{Aeq,1hour}$	<=50 dB	Mon to Fri 21:00-22:00
Sports Pitch	L_{AFmax}	<=65 dB	Mon to Fri 21:00-22:00
People Leaving Sports Pitch	$L_{Aeq,1hour}$	<=50 dB	Mon to Fri 22:00-22:30
People Leaving Community Building	$L_{Aeq,1hour}$	<= 45 dB	Fri/Sat 00:00-00:30

As the archery range is not expected to generate large amounts of noise, and is located further from the houses than the sports pitch and the community building, only the sports pitch and community building have been included in the assessment.

2.5 Nearest Noise Sensitive Properties

The noise sensitive properties in the surrounding area have been grouped into three noise sensitive areas as described below and as indicated on the attached site plan 3519/SP1.

NSA	Location	Direction	Approximate distance from site boundary (metres)
1	houses on South End of Parkside Road	north west	on boundary
2	houses on North End of Parkside Road	north west	on boundary
3	houses on Stead Lane/Warren View	east	16m

The above noise sensitive areas represent the closest noise sensitive properties, with others located further from the site and in some cases screened by the intervening buildings. A satisfactory noise impact at the defined noise sensitive areas should therefore ensure a satisfactory noise impact at other noise sensitive areas.

2.6 Strategy for Noise Impact Assessment

Based on the information in Sections 2.1 to 2.5 above, the strategy for the noise impact assessment has been broken down into the following stages:

i. undertake an environmental noise survey to obtain baseline noise data, as described in Section 3.0 below

ii. construct a 3D computer model of the site and surrounding houses in order to predict the noise egress to the nearby properties

iii. assess the impact of noise emissions from new fixed plant installations as described in Section 4.0 below

iv. assess the impact of noise breakout from the community building during evening functions, as described in Section 5.0 below

v. assess the impact of noise from the sports pitches, as described in Section 6.0 below

vi. assess the impact of noise from patrons leaving the sports pitches and the community building, as described in Section 7.0 below.

3.0 ENVIRONMENTAL NOISE SURVEY

3.1 Purpose

The purpose of the survey was to determine the existing ambient noise levels at locations representative of the surrounding noise sensitive areas, over samples of the proposed operating periods.

3.2 Scope of Survey

A fully attended environmental noise survey was undertaken over four periods. The first measurement period was between 20:00 and 23:00 on Tuesday 6 June 2023. This was to cover the final two hours of football pitch use, as well as the half hour period after the pitches close.

The second was between 02:00 and 05:00 on Friday 9 June 2023. This was to cover the quietest part of the night, which is when plant noise is most likely to be audible to residents.

The third was between 22:00 on Friday 9 June and 01:00 on Saturday 10 June. This was to cover the final two hours of function room use, as well as the half hour period after the function room closes.

The fourth was between 09:00 and 11:00 on Saturday 10 June 2023. This was to cover the first two hours of weekend football pitch use.

3.3 Instrumentation

The instrumentation used, and the field calibration values before and after the survey are detailed in Appendix B of this report.

3.4 Procedure

Three measurement positions were selected as described below and indicated on the attached site plan 3519/SP1:

i. on the site, level with 64 Parkside Road

ii. on the site, level with 40 Parkside Road

iii. on Stead Lane, next to the houses

Position 1 was chosen to be representative of the houses at the south end of Parkside Road (NSA1). Position 2 was chosen to be representative of the houses at the north end of Parkside Road (NSA2). Position 3 was chosen to be representative of the houses on Stead Lane/Warren View (NSA3).

Measurements were taken hourly at each position using a Norsonic 140 sound level meter set to store the octave band and A-weighted 100ms short-term L_{eq} levels over a 15 minute sample of each hour for subsequent post processing.

3.5 Results

The logged data has been post processed to determine $L_{Aeq,T}$ $L_{A90,T}$ and L_{Amax} levels for each 15 minute period, and these have been displayed on the attached tables 3519/T1 to T4.

For the purposes of assessing plant noise and breakout noise from the building, background noise levels for each of the identified noise sensitive areas have been processed as shown in the following table.

The background levels presented below are simply the lowest measured $L_{A90,15mins}$ at each measurement position over the course of the specified survey periods.

NSA	Description	Typical L_{A90} by period dB	
		Any Day 02:00 - 05:00 $L_{A90,15mins}$ For plant noise	Fri/Sat 22:00 - 00:00 $L_{A90,\ 15\ mins}$ For function noise
1	houses on South End of Parkside Road	27	34
2	houses on North End of Parkside Road	27	32
3	houses on Stead Lane/Warren View	27	29

Please refer to Appendix C for explanation of the noise units and the A-weighting term used in this report.

3.6 Weather Conditions

Throughout the survey, weather conditions were fine and dry, with wind speeds generally less than 5 m/s. There was no fog and the ground was not frozen/wet. Overall, weather conditions are not considered to have significantly affected the measured levels.

3.7 Description of Existing Acoustic Environment

Throughout all survey periods, the background levels were controlled by distant traffic noise, with nearby passing traffic causing peaks in the data. As position 1 was closest to Olympus Way and the M1, the background noise levels were highest at this location and quieter at positions 2 and 3.

From around 03:00 to 05:00 on Friday 9 June and from 09:00 to 11:00 on Saturday 10 June, the levels at position 3 were dominated by birdsong. Noise from pedestrians and animals may also have contributed to the measured levels to a degree.

4.0 NOISE IMPACT ASSESSMENT (NEW FIXED PLANT)

4.1 Basis of Assessment

As already mentioned in Section 2.4 above, the plant noise is to be assessed following the methodology of BS 4142.

The standard provides a methodology for assessing the likely impact of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident. The assessment involves comparing the rating level of the sound source with the typical background levels for the period of interest. The standard concludes that if the rating level does not exceed the background levels, the noise impact should be low, depending on the context.

Please refer to Appendix D for an explanation of the technical terms defined in the Standard.

4.2 Specific Sound Level

4.2.1 Computer Model

A computer model of the proposed installation has been constructed using Datakustik Cadna/A 2023 to predict how the sound will radiate from the plant area to the identified NSA.

Within the model all buildings and barriers have been assumed to be acoustically reflective, with ground absorption taken into account as appropriate. The receiver height has been assumed to be *4.5* metres - the approximate height of the closest first floor windows.

4.2.2 Source Sound Levels

The manufacturer's noise data used in the model are shown in the attached plant noise schedule 3519/PNS. As well as the external plant detailed in the schedule, some externally venting plant is proposed, although detailed selections are not available at present. Duct attenuators can be selected at a later date, such that the cumulative rating levels do not exceed the background levels displayed in section 4.4 below. This should equate to 'no observed effect' according to the planning guidance.

4.3 Predicted Sound Levels

The scheduled plant noise levels and insertion losses have been input into the Cadna/A computer model, and the predicted noise levels at each NSA are as follows:-

Location	Predicted $L_{eq,T}$ (dB) at octave band centre frequency (Hz)								$L_{Aeq,T}$ dB
	63	125	250	500	1k	2k	4k	8k	
NSA1 - houses on South End of Parkside Road	21	23	16	11	3	-1	-2	-18	13
NSA2 - houses on North End of Parkside Road	19	24	18	15	7	2	-3	-28	16
NSA3 - houses on Stead Lane/Warren View	20	28	24	22	17	14	11	-18	23

4.4 Background Sound Level

The applicant is seeking permission for a 24-hour period of plant operation. Reference to the survey results summarised in section 3.5 above shows that the lowest background level during the 02:00 to 05:00 measurement period was 27 dB $L_{A90,15mins.}$

4.5 Rating Level

To convert the specific sound level into a rating level, corrections have to be applied for impulsivity, intermittency, tonality and other sound characteristics where such features are present.

4.5.3 Tonality

Using commonly accepted definitions of tonality, the predicted specific sound levels are not tonal except at NSA2, although as the specific sound level is at least 11 dB below the background level, any tonality would not be perceptible at the assessment location. Therefore, a tonal correction is not required.

4.5.4 Impulsivity

The noise emissions from the proposed units should not be impulsive in character, so no correction is required.

4.5.5 Intermittency

As the operation of the plant is dependent on internal conditions, all items of plant will not necessarily be running continuously for the whole of a 1 hour day time or 15 minute night time assessment period. However, with multiple units serving the building and the fact that the specific sound levels are at least 4 dB below the background level, it is unlikely that intermittency would be perceptible at the assessment locations.

4.5.6 Other Sound Characteristics

There are no additional sound characteristics which would warrant the addition of an extra correction.

On that basis, it is not considered necessary to apply any corrections to the specific sound to obtain the rating level.

4.6 Initial Assessment of Impact

The initial assessment of impact for the nighttime period is presented in the table below:

Initial assessment of impact – night time period			
	NSA1	NSA2	NSA3
Specific Sound Level $L_{Aeq,\ 1\ hour}$ (dB)	13	16	23
Character correction (dB)	0	0	0
Predicted Rating Level $L_{Ar,1\ hour}$ (dB)	13	16	23
Background Level (dB)	27	27	27
Excess of rating level over noise limit (dB)	-14	-11	-4
Initial assessment of impact	low	low	low

The predicted rating level is below the typical background level at all NSA during the day and night, so the standard concludes that this is "... *an indication of the specific sound source having a low impact, depending on the context*".

4.7 Context

4.7.7 The Absolute Level of Sound

The specific sound levels and the background levels are low and it is therefore not necessary to adjust the impact for the absolute levels of sound.

4.7.8 The Character and Level of the Specific and Residual Sound

The existing background noise climate was generally controlled by distant traffic noise. Although the character of plant noise is different to traffic noise, as the specific sound level is below the background level at all NSA, it is unlikely that the sound would be incongruous in this case. Thus, the character of the new sound does not adversely affect the impact.

4.7.9 The Sensitivity of the Receptor

The identified NSA appear to be a regular two storey houses, so there is nothing to suggest that the receptor would be any more or less sensitive to noise than usual, and no specific sound insulation measures or acoustic screening are present. On that basis it is not considered necessary to adjust the impact for the sensitivity of the receptor.

4.8 Conclusion

This assessment has demonstrated that when assessed following the methodology of BS 4142:2014, the initial estimate of impact of the proposed plant installations should be low, depending on the context. Furthermore, consideration of the context has shown that this need not affect the initial estimate of impact.

The conclusion of this report is therefore that noise emissions from the proposed plant installations should be compliant with the requirements of the local council.

5.0 NOISE IMPACT ASSESMENT (COMMUNITY BUILDING)

5.1 Introduction

The community building is expected to be open until midnight on occasional Fridays and Saturdays, in order to accommodate functions. As shown in the following noise impact assessment, building materials for the function room have been chosen such that, when the function room is at maximum capacity (approximately 150 people), the resultant noise levels at the nearest houses are at least 5 dB below the prevailing background levels.

5.1 Noise Limits

As described above, the predicted levels from the community building should be at least 5 dB below the prevailing background level. A derivation of the noise limit for each NSA is displayed below:

Noise Impact Assessment – Community Building			
	NSA1	NSA2	NSA3
Lowest Measured $L_{A90,T}$ (22:00 to 00:00) (dB)	34	32	29
Correction (dB)	-5	-5	-5
Noise Limit $L_{Aeq,\ 1\ hour}$ (dB)	29	27	24

5.2 Acoustic Modelling

As shown on the planning application drawings, the external walls comprise a combination of brickwork and glazed curtain walling, while the roof is understood to be an insulated standing seam system. Indicative sound reduction indices for the various proposed materials are shown in the table below:

Structure	Material	Sound reduction (dB) at octave band centre frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Wall	Standard cavity masonry wall	28	34	40	45	50	55	55	55
Glazing	Technal Glazed Curtain Walling	-	26	33	39	42	45	50	-
Roof	Kalzip Insulated Standing Seam Roof	18	30	40	46	49	52	58	-

To predict the noise levels coming from the community building, an internal noise level of around 90 dB(A) has been assumed. The internal noise levels used for the predictions, in octave bands, are displayed in Appendix E and are derived from measurements taken inside a busy pub with loud music.

These data were applied within the computer model to predict the noise levels at the nearby houses.

5.3 Noise Impact Assessment

In the table below, the predicted noise levels from the community building are assessed against the noise limits derived in Section 5.1 above. The range of $L_{Aeq,15mins}$ measured over the same period on the existing site is also presented, for context.

Noise Impact Assessment – Community Building			
	NSA1	NSA2	NSA3
Predicted noise level $L_{Aeq,\ 1\ hour}$ (dB)	28	20	18
Noise Limit (dB)	29	27	24
Excess of predicted level over noise limit (dB)	-1	-7	-6
Measured $L_{Aeq,15mins}$ range(dB)	40 - 42	36 - 40	34

As shown above, the predicted level is below the noise limit in all cases, and is well below the measured $L_{Aeq,15mins,}$ indicating that the noise from the community building would be unlikely to lead to disruption for residents.

Windows and doors should be closed during events involving amplified music but could be openable for quieter events where amplified music is not required.

6.0 NOISE IMPACT ASSESMENT (SPORTS PITCHES)

6.1 Introduction

As described in Section 2.4, the Sport England design guidance note 'Artificial Grass Pitch (AGP) Acoustics – Planning Implications' has been used to assess the noise impact of the proposed sports pitches. In line with the guidance, the sports pitches were modelled in Cadna/A 2023 such that a free field noise level of 58 dB $L_{Aeq,1hour}$ was predicted at 10 metres from the sideline halfway marking of each pitch.

To assess the L_{Amax} levels from the sports pitch, library noise data from measurements at similar sites has been used. The L_{max} data shown in Appendix E was applied to a point source within the 3D model to predict the L_{Amax} levels outside the houses from individual noise events such as shouting and footballs hitting the fence.

6.2 Noise Impact Assessment – $L_{Aeq,1hour}$

The resultant predicted $L_{Aeq,1hour}$ at the boundary of each residential area has been calculated. The noise levels were assessed at the façade of the building and in the gardens. The loudest of the two are presented in the table below, along with the range of measured $L_{Aeq,\ 15\ mins}$ from existing sources over the same period:

Noise Impact Assessment – Sports Pitch Noise $L_{Aeq,\ 1\ hour}$	NSA1	NSA2	NSA3
Predicted noise level $L_{Aeq,\ 1\ hour}$ (dB)	53	52	50
Sport England noise limit (dB)	50	50	50
Excess of predicted level over noise limit (dB)	+2	+3	0
Measured $L_{Aeq,15mins}$ range(dB)	46 – 49	42 – 50	40 – 50

The predicted levels are slightly above the Sport England/WHO Noise Limit of 50 dB $L_{Aeq,1hour}$ and above the measured range of $L_{Aeq,15mins}$ levels but below the WHO limit of 55 dB $L_{Aeq,T}$ for "Serious annoyance" .

The Sport England guidance does not give any specific guidance on how an exceedance of the 50 dB limit should be interpreted. However, it is noted on page 6 that:

"" Exceedance of the WHO guideline values does not necessarily imply significant noise impact and indeed, it may be that significant impacts do not occur until much higher levels of noise exposure are reached" …Therefore it is not necessarily the case that where these levels are exceeded, the noise will adversely affect nearby residential properties"

6.3 Noise Impact Assessment – L_{Amax}

The resultant predicted L_{Amax} at the boundary of each residential area has been calculated. The noise levels were assessed at the approximate height of the first floor windows and in the gardens. The loudest of the two are presented in the table below, again with the existing measured levels for comparison.

Noise Impact Assessment – Sports Pitch Noise L_{Amax}			
	NSA1	NSA2	NSA3
Predicted noise level L_{Amax} (dB)	65	67	60
Noise limit (dB)	65	65	65
Excess of predicted level over noise limit (dB)	0	+2	-5
Measured L_{Amax} range (dB)	58 – 75	64 – 71	62 – 67

The predicted L_{Amax} levels are compliant with the council's criteria across the vast majority of the surrounding properties. The only property at which the level is exceeded is 22/24 Parkside Road, located in NSA2 and located closer to the pitch than the rest of the houses.

It should be noted that the highest levels will only occur when there is a noise event such as a voice or ball strike in the part of the pitch closest to that house. Also, the predicted L_{Amax} levels are generally below the measured L_{Amax} levels from existing sources, indicating a potential lower impact.

6.4 Summary

The assessment of noise from sports activities indicates minor (2 to 3 dB) excesses over the acoustic parameters originally suggested during discussions with the local authority, although the levels are still reasonably low.

In principle it would be possible to reduce the noise levels at the surrounding houses by means of acoustic screening, although in order to ensure full compliance with the agreed criteria, the barrier would need to be very large, at least 3 metres, and the resulting visual impact of such an imposing structure could be considered worse than the relatively minor noise reduction it achieves.

There is mitigation in that the hours of operation are controlled, and the worst case L_{Amax} activity noise levels predicted in this Section would not occur all the time. A noise management plan developed by the sports operator in consultation with local residents may also be useful.

7.0 NOISE IMPACT ASSESMENT (PEDESTRIANS AND CARS)

7.1 Introduction

The noise levels from pedestrians and vehicles leaving the premises has been calculated, using voice noise data from the "Acoustics for Schools – A Design Guide" document and from library data from measurements of cars. The noise data used in the assessment is shown in Appendix E.

The predicted levels have been compared against the criteria in BS 8233. These are shown in Section 2.4 and summarised below.

Noise Source	Parameter	Outdoor Criteria	Most Sensitive Period
People Leaving Sports Pitch	$L_{Aeq,1hour}$	<=50 dB	Mon to Fri 22:00-22:30
People Leaving Community Building	$L_{Aeq,1hour}$	<= 45 dB	Fri/Sat 00:00-00:30

7.2 Noise Impact Assessment – People Leaving Sports Pitch

It is understood that the sports pitch will close at 22:00 and that, in the following 30 minutes, there is likely to be noise from people and vehicles leaving the site.

The sports pitch can be split into four separate pitches for 5 v 5 games. As such, the maximum number of people expected to use the sports pitch at any one time is 40. There could therefore be up to 40 people leaving the site during the 22:00 – 22:30 period.

In the transport statement conducted by AMA (Report No 22153-001), the maximum expected number of vehicle trips associated with the sports pitch during a given hour is 18. It is assumed that the vehicles would travel at around 20 mph or under whilst on the site.

On that basis, the predicted noise levels from the model are presented below, alongside the assessment criteria and the measured $L_{Aeq,15mins}$ during the 22:00-23:00 weekday period. As the assessment period falls within the "daytime" (07:00 to 23:00), the BS 8233 limits apply across the whole building, including in conservatories, with the highest being presented in the table below.

Noise Impact Assessment – People Leaving Sports Pitch			
	NSA1	NSA2	NSA3
Predicted noise level $L_{Aeq,1hour}$(dB)	46	36	32
Noise limit (dB)	50	50	50
Excess of predicted level over noise limit (dB)	-4	-14	-18
Measured $L_{Aeq,15mins}$ from 22:00-23:00(dB)	46	52	37

As shown above, the predicted levels are at or below the noise limit, indicating that the noise from people exiting the site after football matches should be relatively unproblematic.

7.3 Noise Impact Assessment – People Leaving Community Centre

It is understood that the maximum occupancy of the function room in the community centre is 150. There could therefore be up to 150 people leaving the function room between 00:00 and 00:30.

It is assumed, for the purposes of this assessment, that once a function ends, there will be approximately one car for every two people, a total of 75 trips.

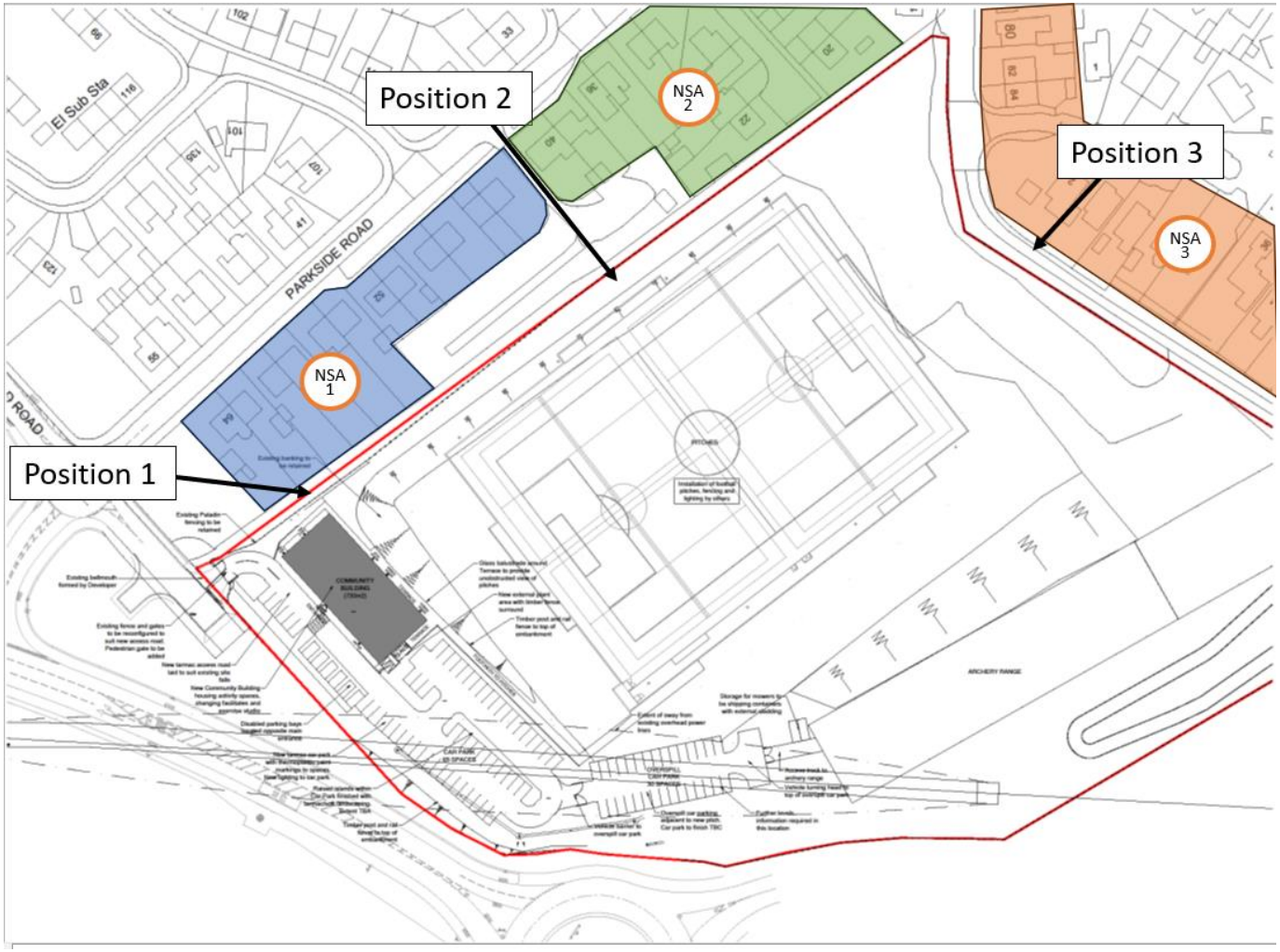
As the 00:00 to 01:00 assessment period falls into the "nighttime" period, the noise levels have been assessed only at the first floor bedroom windows, which is where the BS 8233 internal limit of <=30 dB $L_{Aeq,8hour}$ applies.

On that basis, the predicted noise levels from the model are presented below, alongside the assessment criteria and the measured $L_{Aeq,15mins}$ during the 00:00 - 01:00 Saturday/Sunday morning period.

Noise Impact Assessment – People Leaving Community Centre			
	NSA1	NSA2	NSA3
Predicted noise level $L_{Aeq,1hour}$(dB)	47	42	38
Noise limit (dB)	45	45	45
Excess of predicted level over noise limit (dB)	+2	-3	-7
Measured $L_{Aeq,15mins}$ from 00:00-01:00 (dB)	41	36	30

As shown above, the predicted levels at the nearest bedroom windows are below the noise limit at NSA2 and NSA3 but above the noise limit at NSA1 by +2dB. It should be noted that the noise levels above represent the worst case. Functions are anticipated to occur relatively infrequently, and not every function will fill the room to max capacity, meaning the noise levels will typically be lower than this.

FOR ACOUSTIC DESIGN TECHNOLOGY



Notes

Description

Site Plan Showing Noise Monitoring Locations

Project

Parkside Sports Facility

Date

22 August 2023

Drawing No.

3519/SP1

ADT

Acoustic Design Technology

Noise and Vibration Consultants

WEEKDAY EVENING SURVEY RESULTS (A WEIGHTED TIME HISTORY)

Date	Time	Position	$L_{Aeq,\ 15mins}$ dB	L_{Amax} dB	L_{A90} dB
06/06/2023	20:00-21:00		47	73	41
06/06/2023	21:00-22:00	1	49	75	38
06/06/2023	22:00-23:00		46	60	39
06/06/2023	20:00-21:00		42	64	37
06/06/2023	21:00-22:00	2	42	59	34
06/06/2023	22:00-23:00		52	79	34
06/06/2023	20:00-21:00		40	62	34
06/06/2023	21:00-22:00	3	44	67	33
06/06/2023	22:00-23:00		37	64	31

TABLE 3519/T1

WEEKDAY NIGHTTIME SURVEY RESULTS (A WEIGHTED TIME HISTORY)

Date	Time	Position	$L_{Aeq,\ 15mins}$ dB	L_{Amax} dB	L_{A90} dB
09/06/2023	02:00-03:00		37	53	28
09/06/2023	03:00-04:00	1	32	48	27
09/06/2023	04:00-05:00		41	62	34
09/06/2023	02:00-03:00		30	46	27
09/06/2023	03:00-04:00	2	33	53	27
09/06/2023	04:00-05:00		40	55	33
09/06/2023	02:00-03:00		29	49	27
09/06/2023	03:00-04:00	3	50	68	29
09/06/2023	04:00-05:00		55	73	39

TABLE 3519/T2

FRIDAY EVENING SURVEY RESULTS (A WEIGHTED TIME HISTORY)

Date	Time	Position	$L_{Aeq,\ 15mins}$ dB	L_{Amax} dB	L_{A90} dB
09/06/2023	22:00-23:00	1	42	57	37
09/06/2023	23:00-00:00		40	60	34
10/06/2023	00:00-01:00		41	62	32
09/06/2023	22:00-23:00	2	40	64	35
09/06/2023	23:00-00:00		36	56	32
10/06/2023	00:00-01:00		36	63	31
09/06/2023	22:00-23:00	3	34	50	31
09/06/2023	23:00-00:00		34	53	29
10/06/2023	00:00-01:00		30	54	27

TABLE 3519/T3

WEEKDAY MORNING SURVEY RESULTS (A WEIGHTED TIME HISTORY)

Date	Time	Position	$L_{Aeq,\ 15mins}$ dB	L_{Amax} dB	L_{A90} dB
10/06/2023	09:00-10:00	1	46	58	41
10/06/2023	10:00-11:00		48	65	41
10/06/2023	09:00-10:00	2	44	67	40
10/06/2023	10:00-11:00		50	71	40
10/06/2023	09:00-10:00	3	48	64	39
10/06/2023	10:00-11:00		50	63	39

TABLE 3519/T4

PARKSIDE SPORTS FACILITY

PLANT NOISE SCHEDULE ADT 3519/PNS

PRELIMINARY ISSUE

22 August 2023

ACOUSTIC DESIGN TECHNOLOGY
Noise and Vibration Consultants

Ref.	Plant Description	Location	Duty m^3/s : Pa	Data L_w / L_p	Octave Band Centre Frequency - Hz							
					63	125	250	500	1k	2k	4k	8k
-	CAHV-R450YA-HPB Capacity Priority	Plant area	-	Lp at 1m	66	73	69	67	61	59	61	52
-	PUZ-M50VKA Cooling	Plant area	-	Lp at 1m	50	45	43	42	39	36	28	23
-	PUZ-M50VKA Heating	Plant area	-	Lp at 1m	58	51	45	44	40	37	32	31
-	PUZ-M100VKA Cooling	Plant area	-	Lp at 1m	60	58	53	52	47	44	39	28
-	PUZ-M100VKA Heating	Plant area	-	Lp at 1m	59	55	54	51	48	45	40	31
-	PUZ-M125VKA Cooling	Plant area	-	Lp at 1m	61	58	55	52	50	46	40	32
-	PUZ-M125VKA Heating	Plant area	-	Lp at 1m	62	61	58	55	53	49	43	35

APPENDIX A

NOISE EXPOSURE HIERARCHY TABLE

Perception	Examples of Outcomes	Increasing Effect Level	Action
No Observed Effect Level			
Not noticeable	No Effect	No Observed Effect	No specific measures required
Noticeable and not intrusive	Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

APPENDIX B - INSTRUMENTATION

Manufacturer	Type and / or Model	Serial Number	Last Laboratory Calibration	Calibrator Output (dB)	Free Field Correction (dB)	Initial reading (dB)	Final reading (dB)
Norsonic	Nor140 Class 1 Sound Level Meter (SLM10)	1407647					
Norsonic	Nor1225 ½" Microphone	413060	February 2023		-0.2	113.8	113.5
Norsonic	Nor1209 Preamplifier	22847					
Norsonic	Nor140 Class 1 Sound Level Meter (SLM6)	1404515					
Norsonic	Nor1225 ½" Microphone	142527	April 2023		-0.20	113.8*	113.8*
Norsonic	Nor1209 Preamplifier	13885					
Norsonic	Nor1251 Calibrator (Cal 4)	33453	March 2023	113.98			
Norsonic	Nor1251 Calibrator (Cal 5)	34220	March 2023	114.02			

*Using Cal5

APPENDIX C

Acoustic Terminology

The annoyance produced by noise is dependent upon many complex interrelated factors such as 'loudness', its frequency (or pitch) and any variations in its level. In order to have some objective measure of the annoyance, scales have been derived to allow for these subjective factors.

A-weighting The human ear is more susceptible to mid-frequency noise than the high and low frequencies. To take account of this when measuring noise, the A-weighting scale is used so that the measured noise corresponds roughly to the overall level of noise that is discerned by the average person. It is also possible to calculate the A-weighted noise level by applying certain corrections to an un-weighted spectrum.

When the noise being measured has variable amplitude, such as traffic noise, it is necessary to qualify the basic dB unit. This may be done using a statistical index L_n dB, where n is any value between 0 and 100, and is the percentage of the sample time for which the stated level is exceeded. In defining the use of the index, both the value of n and the length of the sample period must be stated.

L_{10} L_{10}, being the level exceeded for 10% of the time, has been shown to be a good indicator for traffic noise intrusion, and is used in assessing the effect of traffic noise on residential or commercial premises.

L_{90} L_{90} is the level exceeded for 90% of the time, and is used as a measure of background noise level, as it excludes the effects of occasional transient levels, such as individual passing cars or aircraft.

In addition to the statistical noise indices defined above, the following noise units are also used to define variable amplitude noise sources:

$L_{eq,T}$ $L_{eq,T}$ is defined as the notional steady sound pressure level which, over a stated period of time, would contain the same amount of acoustical energy as the actual fluctuating sound measured over the same period. In other words, it is a measure of the "average" noise level

L_{max} L_{max} is the maximum time-weighted sound pressure level recorded over the stated time period

APPENDIX D

Definitions from BS 4142 : 2014

reference time interval, T_r

specified interval over which the specific sound level is determined (1 h during the day, and 15 min during the night)

specific sound level, $L_{Aeq,Tr}$

equivalent continuous A-weighted sound pressure level produced by the specific source at the assessment position produced over a given reference time interval, T_r

rating level, $L_{At,Tr}$

specific sound level plus any adjustment for the characteristic features of the sound

background noise level, $L_{A90,T}$

see Appendix C

APPENDIX E

Noise Data

Noise data: $L_{eq,T}$ at 5m									
	63	125	250	500	1k	2k	4k	8k	A-wt
$L_{eq,T}$ inside building									
Busy pub with loud music – from library data	90	95	81	86	85	82	81	70	90
$L_{eq,T}$ at 1m									
Slow moving car – from library data	94	89	83	81	83	78	70	66	86
"Raised Voice Effort" from "Acoustics for Schools – a Design Guide"	-	51	62	66	62	57	51	43	67
$L_{max,T}$ at 1m									
Sports pitch activities	94	96	88	85	86	91	91	90	97