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Consented Multi Use Games Area at Honeywell Sports Campus
Noise Impact Assessment

For:
Stem Architects

11 November 2022

Ref: NIA/10165/22/10298/v2/Honeywell MUGA
Issue: Client
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1 Introduction

1.1 Overview

Environmental Noise Solutions Ltd (ENS) has been commissioned by Stem Architects to undertake a noise impact assessment (NIA) for a consented multi-use games area (MUGA) at Honeywell Sports Centre, Barnsley (hereafter referred to as 'the site').

Planning permission (ref: 2021/1678) for the MUGA was granted by Barnsley Metropolitan Borough Council (BMBC) in May 2022, subject to conditions. Conditions 7 and 8 relate to the installation of an acoustic fence as follows:

'7. Upon commencement of development full design details of the proposed 2.4m high acoustic fence shall be submitted to and approved in writing by the Local Planning Authority. The 2.4m high acoustic fence shall be installed in its entirety in the location shown on the approved plans prior to the approved development being brought into first use and shall be retained at all times thereafter for the lifetime of the development.

8. Prior to the commencement of development on the works to install the approved acoustic fence, the following documents prepared in accordance with BS5837 (Trees in Relation to Construction 2005: Recommendations) shall be submitted to and approved in writing by the Local Planning Authority:

- *Tree constraints plan (TCP)*
- *Tree protection plan (TPP)*
- *Arboricultural implication assessment (AIA)*
- *Arboricultural method statement (AMS)*

Thereafter the works shall be carried out in accordance with the approved methodologies.'

As the acoustic fence was not a requirement of the previously submitted NIA (ENS report ref: NIA/10165/22/10298/v1), and the consented MUGA has been positioned further from neighbouring noise sensitive receptors, proposals are now to omit the acoustic fence if feasible from a noise perspective.

The objectives of the noise impact assessment were therefore to:

- Establish the noise levels associated with use of the MUGA (in the absence of an acoustic fence)
- Establish the existing noise levels at the nearest noise sensitive receptors to the site during representative time periods
- Assess the potential noise impact of the MUGA on the nearest noise sensitive receptors, in accordance with pertinent guidance

This report details the methodology and results of the noise impact assessment. It has been prepared to accompany a S73 Application to be submitted to BMBC for the removal of Conditions 7 and 8 of Planning Permission ref: 2021/1678.

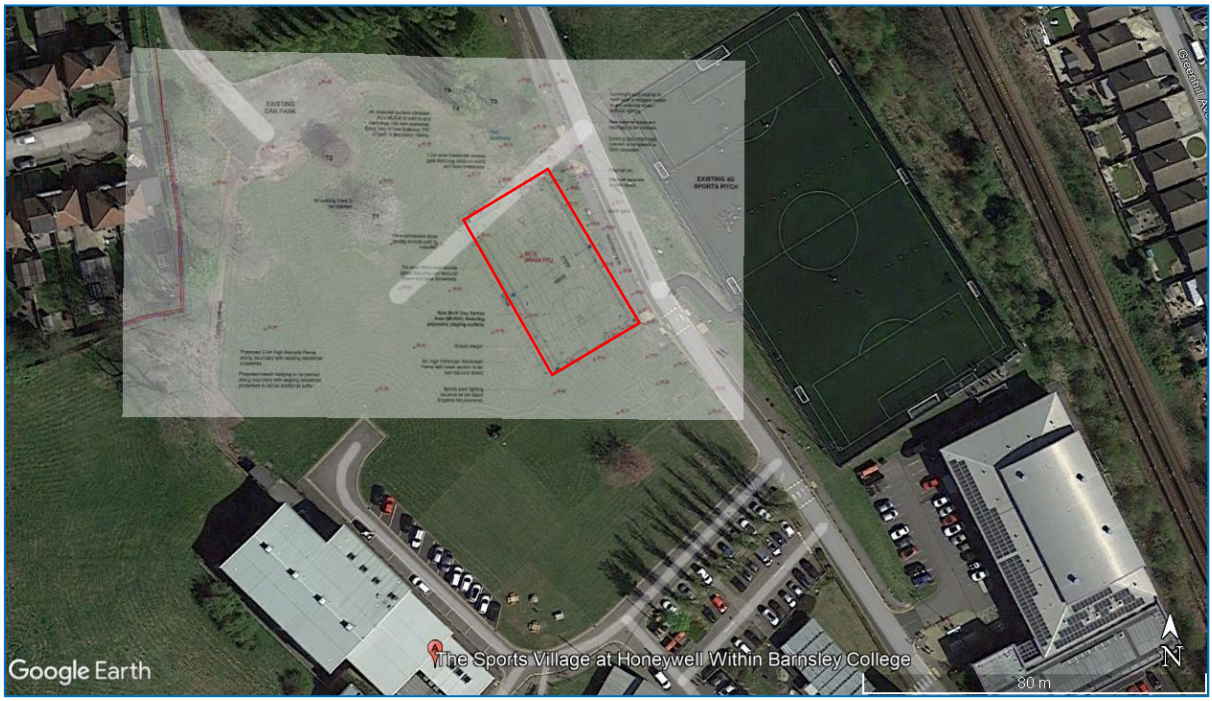
The report has been prepared for Stem Architects for the sole purpose described above and no extended duty of care to any third party is implied or offered. Third parties referring to the report should consult Stem Architects and ENS as to the extent to which the findings may be appropriate for their use.

A glossary of acoustic terms used in the main body of the text is contained in Appendix 1.

1.2 Site Description and Development Proposals

The MUGA is to be located at the north-western corner of the existing Honeywell Sports Campus, Barnsley, as shown (highlighted in red) in Figure 1.1.

Figure 1.1: Site Location



Condition 4 of Planning Permission ref: 2021/1678 restricts the use of the MUGA to 0900–2100 hours on weekdays and 0900–1500 hours on weekends.

The nearest noise sensitive receptor is No. 31 Cockerham Avenue, which is located circa 75 metres to the west of the proposed MUGA.

The noise environment at the site is characterised by distant road traffic on the A635, the A61, and the wider surrounding road network.

2 Policy Context and Assessment Guidance

2.1 National Planning Policy Framework

The National Planning Policy Framework (NPPF)[1] sets out the Government's planning policies for England and how these are expected to be applied.

Where issues of noise impact are concerned the NPPF provides brief guidance in paragraph 170 where it states that planning policies and decisions should contribute to and enhance the natural and local environment by:

'preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of…..noise pollution'.

Paragraph 185 advises 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…..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'.

The NPPF also refers to the 2010 DEFRA publication, the Noise Policy Statement for England (NPSE) which reinforces and supplements the NPPF.

2.2 Noise Policy Statement for England

The Noise Policy Statement for England[2] (NPSE) sets out the long-term vision of promoting good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development. This long-term vision is supported by the following aims:

- Avoid significant adverse impacts on health and quality of life
- Mitigate and minimise adverse impacts on health and quality of life
- Where possible, contribute to the improvement of health and quality of life

The NPSE describes the following levels at which noise impacts may be identified:

- NOEL – No Observed Effect Level. This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise
- LOAEL – Lowest Observed Adverse Effect Level. This is the level above which adverse effects on health and quality of life can be detected
- SOAEL – Significant Observed Adverse Effect Level. This is the level above which significant adverse effects on health and quality of life occur

According to the explanatory notes in the statement, where a noise level falls between the lowest observable adverse effect level (LOAEL) and a level which represents a significant observable adverse effect level (SOAEL):

[1] National Planning Policy Framework. Ministry of Housing, Communities and Local Government (2021)
[2] Noise Policy Statement for England. Government Department for Environment, Food and Rural Affairs (2010)

'….all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life whilst also taking into consideration the guiding principles of sustainable development. This does not mean that such effects cannot occur.'

2.3 Planning Practice Guidance on Noise

Planning Practice Guidance[3] (PPG) is an online resource which provides additional guidance and elaboration on the NPPF. It advises that the Local Planning Authority should consider the acoustic environment in relation to:

- Whether or not a significant adverse effect is occurring or likely to occur
- Whether or not an adverse effect is occurring or likely to occur
- Whether or not a good standard of amenity can be achieved

In line with the Explanatory Note of the NPSE, the PPG references the LOAEL and SOAEL in relation to noise impact. It also provides examples of outcomes that could be expected for a given perception level of noise, plus actions that may be required to bring about a desired outcome. However, in line with the NPSE, no objective noise levels are provided for LOAEL or SOAEL although the PPG acknowledges that:

'…the subjective nature of noise means that there is not a simple relationship between noise levels and the impact on those affected. This will depend on how various factors combine in any particular situation'.

Table 2.1 summarises the PPG noise exposure hierarchy.

Table 2.1: PPG Noise Exposure Hierarchy

Perception	Examples of Outcomes	Increasing Effect Level	Action
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

[3] Planning Practice Guidance on Noise: http://planningguidance.planningportal.gov.uk/blog/guidance/noise/

The PPG also provides general advice on the typical options available for mitigating noise, suggesting that Local Plans may include noise standards applicable to proposed developments within the Local Authority's administrative boundary, although it states that:

'Care should be taken, however, to avoid these being implemented as fixed thresholds as specific circumstances may justify some variation being allowed'.

With regard to the mitigation of extant environmental noise at a proposed residential development, the guidance states that:

'... consideration should also be given to whether adverse internal effects can be completely removed by closing windows and, in the case of new residential development, if the proposed mitigation relies on windows being kept closed most of the time. In both cases a suitable alternative means of ventilation is likely to be necessary. Further information on ventilation can be found in the Building Regulations'.

The subjective nature of noise means that there is not a simple relationship between noise levels and the impact on those affected. This will depend on how various factors combine in any particular situation. The following guidance documents provide some meaningful context.

2.4 Noise Assessment Guidance

Sport England Design Note

Sport England's 'Artificial Grass Pitch (AGP) – Planning Implications: New Guidance for 2015' provides guidance to assess the noise impact of new artificial grass pitches on noise sensitive receptors. The following two assessment methodologies are considered the most appropriate in this case:

- Absolute Assessment Method: This method reflects the guidance contained in the WHO 'Guidelines for Community Noise', recommending that external noise levels from sports events should not exceed 50 dB $L_{Aeq,\,T}$ at the nearest noise-sensitive receptor

- Comparative Assessment Method: This method makes comparison of external sports activity noise against the existing noise climate. Reference is made to the IOA/IEMA Woking Party Consultation Draft 2002, superseded by Guidelines for Environmental Noise Impact, providing the impact of change in noise levels. Sport England recommends the introduction of a new pitch should not result in an increase of the existing noise climate by more than 3 dB, which is the 'minimum perceptible under normal conditions'

Although the document is now superseded, useful contextual guidance is also contained in 'A Guide to the Design, Specification and Construction of Multi Use Games Areas (MUGAs)' by Sport England, which advised that:

'It is normally advisable to locate a MUGA (especially floodlit ones) at least 12m, and ideally at least 30m from other residences.'

With cognisance to this, it should be noted that the proposed MUGA has been situated at least 30 metres from the nearest noise sensitive receptors.

3 Noise Survey and Results

3.1 Overview

In order to determine the existing ambient noise levels at the nearest noise sensitive receptors, noise monitoring was carried out on Monday 10th January and Sunday 16th January 2022. The noise surveys were undertaken in accordance with the requirements of the relevant parts of BS 7445 '*Description and Measurement of Environmental Noise'*.

For the purpose of the assessment, a single noise monitoring position (Position 1) was adopted in the vicinity of No. 31 Cockerham Avenue (see Appendix 2 for monitoring location).

Noise measurements were undertaken using Bruel & Kjaer 2250 Type 1 integrating sound level meters. The meter was connected to a windshield covered microphone positioned at the location detailed above.

The measurement system calibration was verified immediately before and after the survey period using a Bruel & Kjaer Type 4231 calibrator. No drift in calibration levels was noted.

Measurements consisted of A–weighted broadband parameters together with linear octave band data.

The noted weather conditions during the survey were dry with wind speeds < 5 m/s. Weather conditions were therefore considered appropriate for noise monitoring.

3.2 Summary of Results

Table 3.1 presents a summary of the noise data for each measurement session, rounded to the nearest decibel.

Table 3.1: Summary of Noise Measurement Data

Date	Time	L_{Aeq} (dB)	L_{A90} (dB)	Comment
10/01/22	1112–1212	48	45	Distant road traffic noise
10/01/22	1212–1312	48	45	
10/01/22	1801–1901	48	45	Distant road traffic noise
10/01/22	1901–2001	48	44	
10/01/22	2001–2101	45	41	Distant road traffic noise
10/01/22	1801–1901	44	40	
16/01/22	1007–1107	47	43	Distant road traffic noise
16/01/22	1107–1207	47	44	
16/01/22	1207–1307	48	45	
16/01/22	1307–1407	46	43	
16/01/22	1407–1507	46	42	
16/01/22	1507–1607	45	41	
16/01/22	1607–1652	46	42	

Ambient noise levels during the daytime and early evening were circa **48 dB $L_{Aeq\ (1\ hour)}$**. Ambient noise levels during the late evening were circa **44 dB $L_{Aeq\ (1\ hour)}$**. Ambient noise levels during Sunday were circa **46 dB $L_{Aeq\ (1\ hour)}$**.

4 Noise Impact Assessment

4.1 MUGA Noise Levels

In terms of potential noise associated with use of the MUGA, ENS has previously undertaken measurements at an existing comparably sized outdoor 3G pitch at Ryton & Crawcrook Albion Football Club during an adults' 7-a-side match. Given the relatively small size of the proposed pitch, this is considered worst-case in terms of potential use.

Noise measurements encapsulated raised voices, referee's whistles, and the ball hitting the rebound boards, and were measured at circa **53 dB $L_{Aeq\ (1\ hour)}$** at 10 metres from the side-line halfway marking.

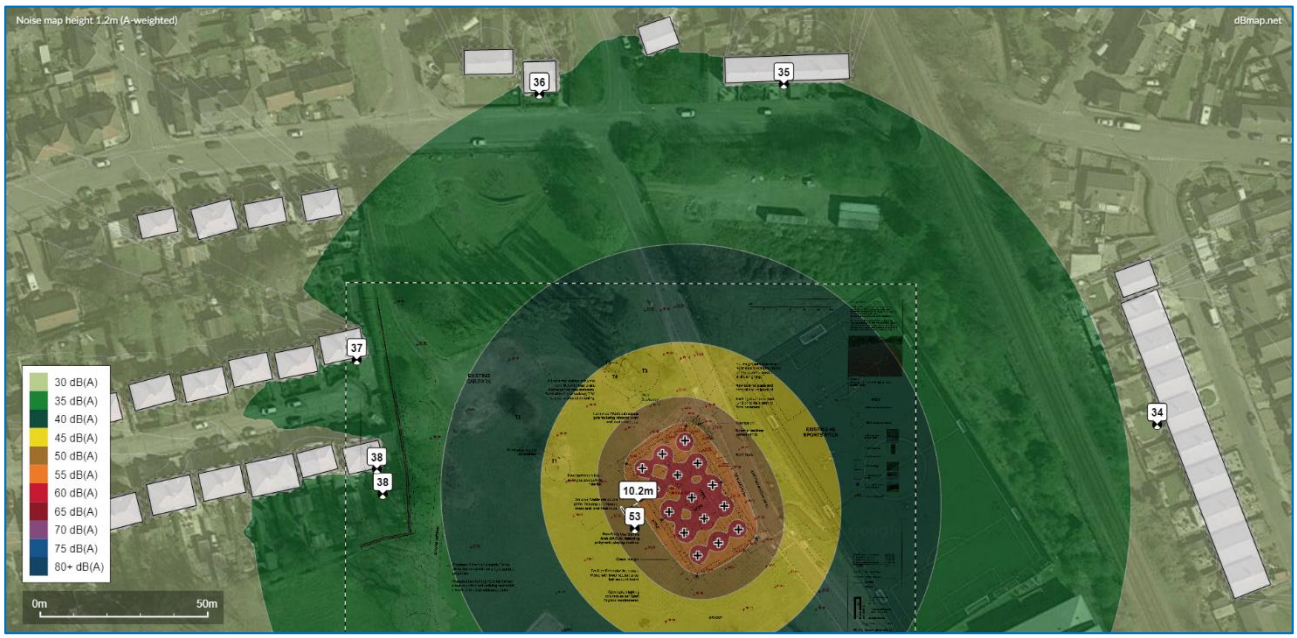
Adopting this as a representative noise level, noise propagation from the MUGA has been calculated using dBMap noise modelling tool.

A number of evenly spaced point sources were entered into the location of the proposed MUGA. The sound power levels of all point sources were adjusted equally until the calculated sound pressure level was 53 dB $L_{Aeq\ (1\ hour)}$ at 10 metres from the side of the halfway line.

To reiterate, no acoustic fence is proposed, and therefore for the purposes of the assessment, the MUGA is robustly assumed to be unscreened from all surrounding receptors.

As evidenced in Figure 4.1 below, the resultant noise level at surrounding receptors is **≤ 38 dB $L_{Aeq\ (1\ hour)}$.**

Figure 4.1: Noise Map Showing Propagation from Proposed MUGA



4.2 Impact Assessment

Absolute Method

With respect to the absolute criteria described in the Sport England guidance, noise associated with use of the MUGA is at least **12 dB** below the target criteria of **50 dB $L_{Aeq, T}$**.

Comparative Method

The following table contains the ambient noise level increases at various times due to the use of the MUGA.

Table 4.1: Cumulative Ambient Noise Levels at NSRs

Period	Existing Ambient Noise Level	Predicted Worst-Case MUGA Noise Level	Cumulative Noise Level	Increase in Ambient Noise Level
Daytime	48 dB $L_{Aeq\ (1\ hour)}$	38 dB $L_{Aeq\ (1\ hour)}$	48 dB $L_{Aeq\ (1\ hour)}$	0
Early Evening	48 dB $L_{Aeq\ (1\ hour)}$	38 dB $L_{Aeq\ (1\ hour)}$	48 dB $L_{Aeq\ (1\ hour)}$	0
Late Evening	44 dB $L_{Aeq\ (1\ hour)}$	38 dB $L_{Aeq\ (1\ hour)}$	45 dB $L_{Aeq\ (1\ hour)}$	+1
Sunday	46 dB $L_{Aeq\ (1\ hour)}$	38 dB $L_{Aeq\ (1\ hour)}$	47 dB $L_{Aeq\ (1\ hour)}$	+1

The above assessment confirms that noise levels associated with use of the MUGA is fully compliant with the criteria set out in Section 2 of this report, even during the late evening, with no specific mitigation measures required.

Summary

In terms of the NPPF PPG noise exposure categories detailed in Table 2.1, noise from use of the MUGA is therefore considered to represent the no observed effect level (NOEL), in that:

- It can be heard, but does not cause a change in behaviour
- It may slightly affect the acoustic character of the area, but not to the extent that there is a perceived change in the quality of life

The recommended action at this level is that no specific measures are required.

On this basis, it is evident that the acoustic fence is not required, and that Conditions 7 and 8 of Planning Permission ref: 2021/1678 may therefore be removed.

5 Summary and Conclusions

A noise survey and assessment has been performed for the proposed removal of Conditions 7 and 8 of Planning Permission ref: 2021/1678 in relation to the consented MUGA at Honeywell Sports Centre, Barnsley.

Baseline noise monitoring was carried out on Monday 10th January and Sunday 16th January 2022 to determine the baseline noise levels at the nearest noise sensitive receptors.

The assessment has determined that noise levels associated with use of the MUGA are compliant with the criteria outlined in Sport England's 'Artificial Grass Pitch (AGP) – Planning Implications: New Guidance for 2015', with no specific mitigation measures required.

In terms of the NPPF, noise from use of the MUGA is therefore considered to represent the no observed effect level (NOEL). The recommended action at this level is that no specific measures are required.

On this basis, it is evident that the acoustic fence is not required, and that Conditions 7 and 8 of Planning Permission ref: 2021/1678 may therefore be removed.

Appendix 1 – Abbreviations and Definitions

Sound Pressure Level (L_p)
The basic unit of sound measurement is the sound pressure level. As the pressures to which the human ear responds can range from 20 μPa to 200 Pa, a linear measurement of sound levels would involve many orders of magnitude. Consequently, the pressures are converted to a logarithmic scale and expressed in decibels (dB) as follows:

$L_p = 20 \log_{10}(p/p_o)$

Where L_p = sound pressure level in dB; p = rms sound pressure in Pa; and p_o = reference sound pressure (20 μPa).

A-weighting
A frequency filtering system in a sound level meter, which approximates under defined conditions the frequency response of the human ear. The A-weighted sound pressure level, expressed in dB(A), has been shown to correlate well with subjective response to noise.

Equivalent continuous A-weighted sound pressure level, $L_{Aeq, T}$
The value of the A-weighted sound pressure level in decibels of continuous steady sound that within a specified time interval, T, has the same mean-square sound pressure as a sound that varies with time. $L_{Aeq, 16h}$ (07:00 to 23:00 hours) and $L_{Aeq, 8h}$ (23:00 to 07:00 hours) are used to qualify daytime and night time noise levels.

$L_{A10, T}$
The A-weighted sound pressure level in decibels exceeded for 10% of the measurement period, T. $L_{A10, 18h}$ is the arithmetic mean of the 18 hourly values from 06:00 to 24:00 hours.

$L_{A90, T}$
The A-weighted sound pressure level of the residual noise in decibels exceeded 90% of a given time interval, T. L_{A90} is typically taken as representative of background noise.

L_{AFmax}
The maximum A-weighted noise level recorded during the measurement period. The subscript 'F' denotes fast time weighting, slow time weighting 'S' is also used.

Single Event Level / Sound Exposure Level (SEL or L_{AE})
The energy produced by a discrete noise event averaged over one second, regardless of the event duration. This allows for comparison between different noise events which occur over different lengths of time.

Weighted Sound Reduction Index (R_W)
Single number quantity which characterises the airborne sound insulation properties of a material or building element over a defined range of frequencies (R_W is used to characterise the insulation of a material or product that has been measured in a laboratory).

Appendix 2 – Baseline Measurement Position

