BOXXER

VITALITY STADIUM, BOURNEMOUTH
27th MAY 2023

NOISE MANAGEMENT PLAN

20 April 2023

AEC REPORT: P4909/R1/WJK

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CITATION APPROVED HEALTH & SAFETY SYSTEMS

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DOCUMENT STATUS

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1.0 INTRODUCTION

1.1 Acoustic & Engineering Consultants Limited (AEC) has been appointed by Boxxer to provide a Noise Management Plan to assist in the monitoring and management of sound from the LAWRENCE OKOLIE Vs CHRIS BILLAM Boxing event at Vitality Stadium Bournemouth. The event is planned to take place from 1600hrs (gates open) to 0000hrs on Saturday 27th May 2023.

1.2 This report details the sound management scheme that will be put in place to monitor and manage amplified entertainment noise from music and commentary at noise sensitive properties. Measures that should be adopted to achieve compliance with the agreed noise conditions are specified in section 3.

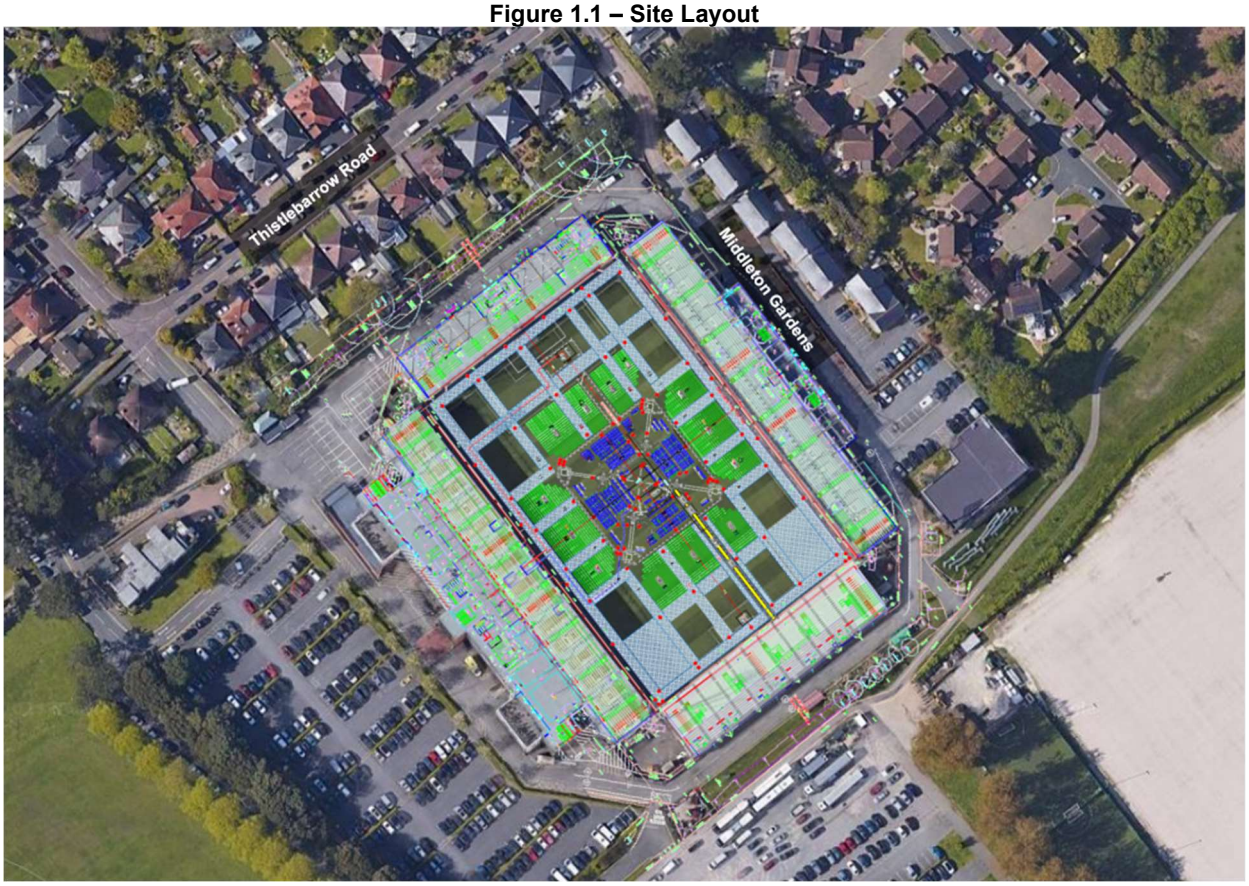
1.3 This document should be considered as a live document which may develop further as a result of liaison with the event promoter, Bournemouth, Christchurch & Poole Council and local residents.

1.4 Acoustic terminology used throughout this report is described in brief in Appendix A.

Boxxer Event

1.5 The event is a 1-day boxing event consisting of several undercard bouts and main event on the centre of the pitch of the Vitality Stadium. There will be a DJ providing incidental amplified music between events with shorter burst of music during walk-ons and between rounds. Introductions and post-fight interviews will also be amplified. The nearest noise sensitive properties are located along Thistlebarrow Road to the north-west and Middleton Gardens to the north-east. A site location plan is provided on the following Figure 1.1.

Figure 1.1 – Site Layout



2.0 ENTERTAINMENT NOISE LIMITS

Noise Council's Code of Practice on Environmental Noise Control at Concerts (1995)

2.1 Although there are no specific criteria for this type of event, guidance for noise from outdoor music events is provided in the Noise Council's Code of Practice on Environmental Noise Control at Concerts (1995). The Music Noise Level (MNL) guideline noise limits contained within the Code of Practice for events that are held between 0900 and 2300h are summarised in Table 2.1, below.

Table 2.1 – Recommended Noise Limits

Concert days per calendar year, per venue	Venue Category	Guideline
1 to 3	Urban Stadia or Arenas	The MNL should not exceed 75 dB(A) over a fifteen-minute period
1 to 3	Other Urban and Rural Venues	The MNL should not exceed 65 dB(A) over a fifteen-minute period
4 to 12	All Venues	The MNL should not exceed the background noise level by more than 15dB(A) over a 15-minute period

2.2 It is understood that the venue premises licence conditions are based on the above guidance for Urban Stadia. Therefore, noise from amplified sources associated with the event should not exceed 75dBA over a fifteen-minute period at the nearest noise sensitive properties.

2.3 It is recognised that although it provides useful guidance, the Code of Practice may not be applicable to every event type and genre, particularly where music may not be the primary source of entertainment or be continuous over the duration of the event. In addition, although the guidance recognises the noise impact on the local community in the step down in permitted noise levels as the number of event days increase, it does not provide categories to account for the duration of an event. For example, a three-day festival lasting for twelve hours each day should not be considered in the same way as a one-day event lasting for 7 hours over a single day.

2.4 In the case of a boxing event, music will not be the primary source of entertainment and consequently amplified music will be significantly lower and shorter in duration than those normally associated with a concert.

2.5 Under certain circumstances, licensing authorities have allowed for a relaxation of normal conditions for events of cultural or local significance as there may be a greater tolerance of the potential disturbance within the local community.

Low Frequency Noise

2.6 The Noise Council's Code of Practice on Environmental Noise Control at Concerts provides guidance with regard to low frequency noise, stating that the '*assessment of noise in terms of dB(A) is very convenient but it can underestimate the intrusiveness of low frequency noise. Furthermore, low frequency noise can be very noticeable indoors. Thus, even if the dB(A) guideline is being met, unreasonable disturbance may be occurring because of the low frequency noise. With certain types of events, therefore, it may be necessary to set an additional criterion in terms of low frequency noise, or apply additional control conditions'.*

2.7 The Code of Practice provides a footnote to this guidance which states that:

- It has been found that it is the frequency imbalance which causes disturbance. Consequently, there is less of a problem from the low frequency content of the music noise near to an open-air venue than further away.

- Although no precise guidance is available the following may be found helpful: A level up to 70dB in either of the 63Hz and 125Hz octave frequency band is satisfactory: a level of 80dB or more in either of those octave band frequency bands causes a significant disturbance.

2.8 The footnotes were based on the study of low frequency sound from concerts (A Study of Low Frequency Sound from Pop Concerts J.E.T. Griffiths, J. Staunton and S. Kamath (ProcIOA, Vol 15, Part 7, 1993) which concluded that:

- The 'A' weighted criterion can underestimate annoyance at greater distances from the venue (in excess of 2km) as the mid to high frequency energy is quickly attenuated with respect to low frequency and the expectation of people living some distance from the event being that it should be inaudible.

- Sound pressure levels in excess of 80dB in the 63Hz or the 125 Hz octave bands recorded *in excess of 2km* from the concert, are likely to give rise to complaints of low frequency noise. Levels below 70dB are likely to be acceptable at this distance or further away.

3.0 PREDICTED NOISE LEVELS

3.1 Noise predictions have been carried out at the nearest noise sensitive locations using CadnaA noise mapping software which predicts environmental noise levels in accordance with the guidance in ISO 9613-2:1996 *'Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation'.*

3.2 Noise predictions have been carried out based on the information supplied by the sound system company to achieve an entertainment noise level of 90dBA in the audience area.

3.3 The following assumptions have been made in the prediction of noise levels:

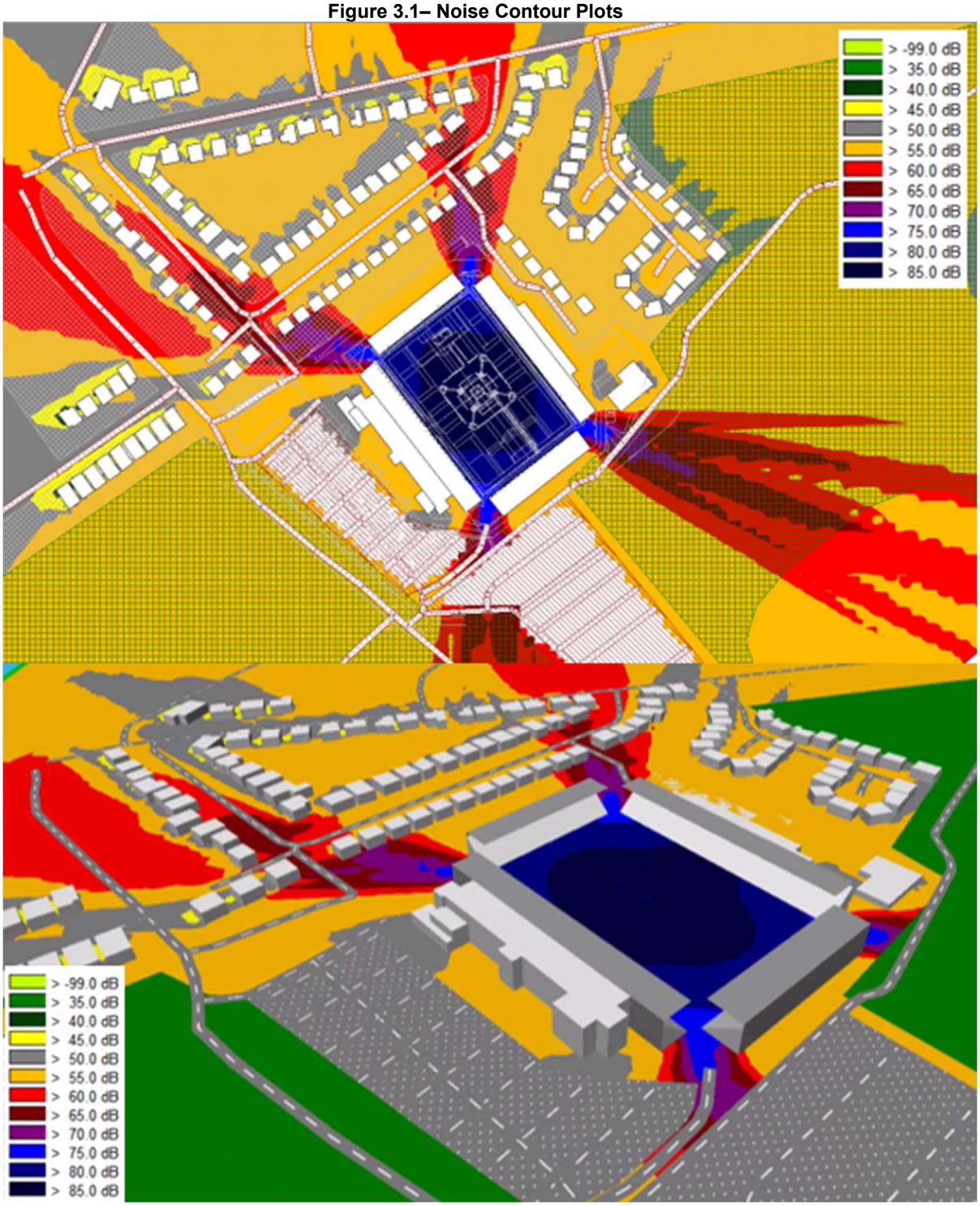
- Ground attenuation effects as per ISO 9613

- Moderate downwind propagation as per ISO 9613

- The horizontal dispersion data from a line array sound system in accordance with table 12 of the Supplement to the Saxonian study on noise from recreational activities, 2019.

3.4 The noise contour plots are provided in the following Figure 3.1.

Figure 3.1– Noise Contour Plots



3.5 The noise contour plots demonstrate that the proposed noise limits would be achieved at all noise sensitive locations. The contour plots also indicate that the noise impact is restricted to a limited number of properties along Thistlebarrow Road. At other locations, noise levels from the event would be significantly below the proposed noise limits.

4.0 NOISE MANAGEMENT PLAN

4.1 Careful consideration will be given to implementing a noise management programme during any sound checks and the event to manage amplified noise from the venue. The noise management plan will be agreed with the Local Authority prior to the event.

4.2 Details of the noise management plan are provided below:

Noise Predictions & Assessment

4.3 A detailed noise contour model and noise assessment will be provided to the Local Authority prior to the licensing committee hearing on 28 April 2023. The noise contour model will show the predicted noise levels at noise sensitive community sites and assess the effect of the use of acoustic barriers.

Plant Noise

4.4 All plant noise associated with the event (generators, chillers etc) will be located as far away from noise sensitive properties as possible. Where required, appropriate mitigation measures will be considered.

Barriers

4.5 Depending on the noise assessment outcome, the use of barriers may be considered. Any barriers should be located close to the noise source or receptor and constructed of as high mass and density material as possible. The barriers should be positioned so there is no line of sight between the source and noise sensitive properties and constructed so they are higher than the height of the sound system. It is essential that there are no gaps in any barriers in order for them to retain their acoustic integrity.

Sound System

4.6 The sound system providing commentary and music will be a Martin Audio MLA which is a highly controllable system and known to provide improved sound coverage and reduced overspill into neighbouring areas (under neutral meteorological conditions). The sound system will be made up of much smaller clusters of loudspeakers than would be generally used at concerts which will be positioned on each corner of the ring structure. The loudspeaker clusters will be highly directional and utilised to provide sound coverage to smaller audience areas. Sound reinforcement to the stands will be provided by the in-house stadium PAVA sound system.

4.7 The sound system should be carefully designed and aligned to optimise sound coverage throughout the audience areas and balance this against the offsite environmental noise impact. It is recommended that the sound system is as distributed as possible and loudspeakers are positioned in such a way as to minimise the distance between the sound sources and audience areas. This type of configuration effectively means that the sound system does not need to operate at as high levels to provide even coverage to the intended audience areas at the back of the arena.

4.8 The appointed sound system supplier will be informed of the requirements of noise management and their contract of hire should specify that the overall control of noise levels will be set and controlled by the event promoter or their appointed noise management consultant.

Pre-Event Information

4.9 An appropriate form of communication such as a letter or newspaper advertisement will be circulated to local residents at least 7 days prior to the event, informing them of the details of the event and including start and finish times of both the event and any sound-checks. The advertisement should also include a dedicated telephone number for noise complaints.

4.10 A dedicated telephone noise complaints line will be made available for the duration of the event. The noise complaints line will be manned and located within the stadium offices. Should a noise complaint be received, the details will be passed to the appointed acoustic consultant either by telephone or text message and investigated. The complainant will be visited if requested or noise levels will be monitored in the general area of the complaint. If noise levels are above those agreed, immediate action would be taken to reduce the noise at source. The complainant will be informed of any action taken or alternatively advised if the noise limits are being complied with at that time.

4.11 A complaints log will be kept and maintained throughout the event, detailing the time of complaint, address and any actions taken and will be held on file by Bournemouth Football Club. The noise complaints log will be made available to the Local Authority.

4.12 The event promoter will agree timings for the production set up and any rehearsals or sound-checks.

4.13 The event promoter or their representative will liaise with the Council and comply with their complaint procedure and comply with any reasonable instructions given by the licensing authority.

4.14 AEC will provide one consultant to monitor and manage onsite and offsite noise levels.

Event Sound Management

4.15 Onsite entertainment noise levels will be monitored over $L_{Aeq,1min}$ and $L_{Aeq,15min}$ intervals. The noise limit will be set as a 15-minute measurement period, but the 1-minute measurements will provide the consultant with immediate information so that the 15-minute noise limit is not exceeded.

4.16 Attended noise measurements outside of the site will be taken at the nearest noise sensitive locations on Thistlebarrow Road and Middleton Gardens and in response to any complaints that may be received. Action necessary to reduce amplified noise levels will be relayed to the control position and immediate instructions issued to the sound engineer to resolve any potential problems. The agreed offsite noise monitoring locations will be visited in turn to establish which is most affected by noise from the event. This location will then be used as the control point to identify and manage the noise sources on site.

4.17 A routine inspection of any peripheral activities associated with the event will be carried out to ensure that any sound systems are switched off and remain off after the advertised finish time.

Venue Egress

4.18 Pre-event communications with ticket holders will include information to encourage them to leave quickly and quietly after the event. This will be supported with further measures on the day of the event.

4.19 At the conclusion of the event, the Master of Ceremonies will deliver a message to the crowd requesting that they leave as quietly as possible and to remind them that they are in a residential area. The big screens in the stadium will display a similar message.

4.20 It is anticipated that the majority of spectators will leave via exits to the south of the stadium towards the car parks and public transport, away from the nearest noise sensitive properties. Bournemouth AFC will provide stewards around the stadium and along external routes close to noise sensitive properties to encourage spectators to keep the noise down as far as is reasonably practical.

Telephone Complaints Line

4.21 A telephone noise complaints number will be confirmed prior to the event.

APPENDIX A - Acoustic Terminology in Brief

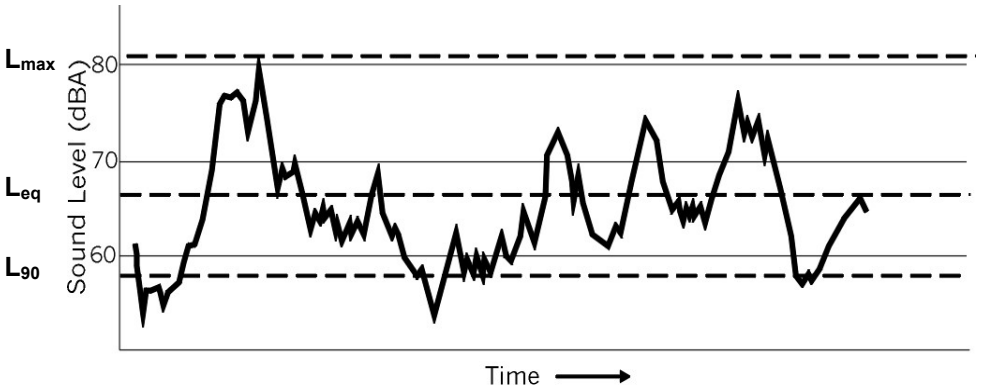
Sound is produced by mechanical vibration of a surface, which sets up rapid pressure fluctuations in the surrounding air. The rate at which the pressure fluctuations occur determines the pitch or *frequency* of the sound. The frequency is expressed in Hertz *(Hz)*, that is, cycles per second. The human ear is sensitive to sounds from about 20 Hertz to 20,000 Hertz. Although sound can be of one discreet frequency - a 'pure tone' - most noise is made up of many different frequencies.

The human ear is more sensitive to some frequencies than others, and modern instruments can measure sound in the same subjective way. This is the basis of the A-weighted sound pressure level *dBA,* normally used to assess the effect of noise on people. The dBA weighting emphasises or reduces the importance of certain frequencies within the audible range.

Noise Units

In order to assess environmental noise, measurements are carried out by sampling over specific periods of time, such as fifteen minutes or one hour, the statistically determined results being used to quantify various aspects of the noise.

The figure below shows an example of sound level varying with time. Because of this time variation the same period of noise can be described by several different levels. The most common of these are described below.



Example of Sound Level Varying With Time

$L_{Aeq,T}$ The equivalent continuous (A-weighted) sound level. May be thought of as the "average" sound level over a given time, T. It is used for assessing noise from various sources: industrial and commercial premises, construction sites, railways and other intermittent noises and can be considered as the "ambient" noise level.

L_{A90} The (A-weighted) sound level exceeded for 90% of a measurement period. It is the value used to describe the "background" noise.

L_{Amax} The maximum (A-weighted) sound level during a measurement period.

Free-field Level This refers to the sound level measured outside, away from reflecting surfaces.

L_{AE} The A-weighted sound exposure level is the equivalent noise level of an event as if the event was of one-second duration and allows the overall average, L_{Aeq}, level to be determined over different time periods for a number of events. L_{AE} is a mathematical unit which cannot easily be described in terms of perception.