



Matt's BBQ 2021, St Clere Estate, Sevenoaks

Noise Management Plan

BJP Productions Limited

Revision 0

30 June 2021

Role	Name	Position	Signature	Date
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1 Introduction

1.1 Appointment

1.1.1 F1 Acoustics Company Limited (F1AC) has been appointed by BJP Productions Limited (BJP) to provide sound control management for Matt's BBQ to be held at St Clere Estate (London Road), Kemsing, Sevenoaks, on Saturday 14th August 2021.

1.1.2 This Noise Management Plan (NMP) contains details of the noise management strategies that will be implemented by F1AC on behalf of BJP, at all times during the events.

1.2 Code of Practice on Environmental Noise Control at Concerts

1.2.1 The Code of Practice on Environmental Noise Control at Concerts contains the following relevant guidance regarding the off-site noise limits at the nearest noise sensitive receptors (NSRs):

“3.1 The Music Noise Levels (MNL) when assessed at the prediction stage or measured during sound checks or concerts should not exceed the guidelines shown in Table 1 at 1 metre from the façade of any noise sensitive premises for events held between the hours of 09.00 and 23.00.

Table 1

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 15 minute period
1 to 3	Other Urban and Rural Venues	The MNL should not exceed 65 dB(A) over a 15 minute period
4 to 12	All Venues	The MNL should not exceed the background noise level by more than 15 dB(A) over a 15 minute period

Notes to Table 1

1. *The value used should be the arithmetic average of the hourly LA90 measured over the last four hours of the proposed music event or over the entire period of the proposed music event if scheduled to last for less than four hours.*

2. *There are many other issues which affect the acceptability of proposed concerts. This code is designed to address the environmental noise issue alone.*

3. *In locations where individuals may be affected by more than one venue, the impact of all the events should be considered.*

4. *For those venues where more than three events per calendar year are expected, the frequency and scheduling of the events will affect the level of disturbance. In particular, additional discharges can arise if events occur on more than three consecutive days without a reduction in the permitted MNL.*

5. *For indoor venues used for up to about 30 events per calendar year an MNL not exceeding the background noise by more than 5 dB(A) over a fifteen minute period is recommended for events finishing no later than 23.00 hours.*

6. *Account should be taken of the noise impact of other events at a venue. It may be appropriate to reduce the permitted noise from a concert if the other events are noisy.*

7. *For venues where just one event has been held on one day in any one year, it has been found possible to adopt a higher limit value without causing an unacceptable level of disturbance.*

3.2 *For events continuing or held between the hours 23.00 and 09.00 the music noise should not be audible within noise-sensitive premises with windows open in a typical manner for ventilation.*

Notes on Guidelines 3.2

1. *The use of inaudibility as a guideline is not universally accepted as an appropriate method of control. References 6 & 7 (Appendix 1) set out the various issues. This guideline is proposed as there is insufficient evidence available to give more precise guidance.*

2. *Control can be exercised in this situation by limiting the music noise so that it is just audible outside the noise sensitive premises. When that is achieved it can be assumed that the music noise is not audible inside the noise sensitive premises.*

3.3 The nature of music events means that these guidelines are best used in the setting of limits prior to the event (see 4.0).

3.4 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.

Notes to Guideline 3.4

1. 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.

2. Although no precise guidance is available the following may be found helpful (Ref.8): A level up to 70 dB in either of the 63 Hz or 125 Hz octave frequency band is satisfactory; a level of 80 dB or more in either of those octave frequency bands causes significant disturbance.

3.5 Complaints may occur simply because people some distance from the event can hear it and that, consequently, they feel the music must be loud even though the guidelines are being met. In fact topographical and climatic conditions can be such that the MNL is lower at locations nearer to the venue.”

1.2.2 A glossary of acoustic terms is provided in Appendix A to assist the reader.

1.3 About F1 Acoustics Company Limited

1.3.1 F1AC are specialists in event and festival sound control and have provided services for festivals including Glastonbury, Boomtown, Leeds, Latitude, Kendall Calling and Festival No. 6 plus numerous other single stage and multi-stage events across the UK. We have a combined experience of over 26 years providing high quality sound control services and all of our Consultants are Members of the Institute of Acoustics. As well as entertainment sound control the company provides advice to clients on a spectrum of acoustics and noise related matters and our staff have presented expert testimony at

planning and licencing hearings as well as being accustomed to liaising with Local Authority Officers regarding noise issues.

- 1.3.2 F1AC has used National Guidelines, The Code of Practice on Environmental Noise Control at Concerts (The Noise Council, 1995) and our expert experience in this sector to tailor this Noise Management Plan for the type of event, number of customers, number of stages and location to ensure an achievable sound management protocol is established.

2 Site, Environs and Details of the Event

2.1 Site Location

2.1.1 The event site is situated at St Clere Estate, Kemsing, Sevenoaks. The site is bounded to the south by M20, to the north and east by London and to the west by agricultural land.

2.1.2 The site is within a rural area. The site has a few local noise sensitive premises to the north on London Road and Labour-In-Vain Road, to the east on Old Coach Road and to the west on Terry's Lodge Road. A plan showing the event site location, nearest noise sensitive receptors and surrounding area is included as Figure 1.

2.1.3 The character of the event site is rural with road traffic noise. The main noise sources in the area are road traffic on M20 and London Road (A20).

Matt's BBQ 2021

2.1.4 The event will be held on Saturday 14th August 2021 from 12:00 to 22:30. A plan showing the site layout including the location and orientation of the stages is included as Figure 2.

2.1.5 The stages at the event will be:

- Outdoor Main Stage
- Stage 2 within a marquee
- Stage 3 (13:00 to 17:00) / Carnival Truck (17:00 – 22:30)

2.1.6 Details of the sound system that is proposed to be installed are:

Main Stage

- 8x L'Acoustic K2 (L&R Flown at 7 m high, 12 m apart)
- 12x L'Acoustic SB28 subwoofers (equally spaced across the stage in 4 cardioid stacks)
- 4x L'Acoustic Kara as infills at the front of the stage
- On stage monitors

Stage 2

- 6x L'Acoustic Kara (L&R Stacked on top of the subs, 8 to 10 m apart)
- 6x L'Acoustic SB28 subwoofers (spaced 8 to 10 m apart in 2 cardioid stacks)

- On stage monitors

Stage 3 / Carnival Truck

- 2x QSC 152 (L&R)
- 2x QSC KW181 (L&R)

Carnival Truck

- 4x L'Acoustic ARC (Stacked on top of the subs)
- 4x L'Acoustic SB28 subwoofers

3 Sound Control Procedure

3.1 Personnel

3.1.1 To ensure the proposed music noise level (MNL) is controlled in accordance with the Licensing Act 2003, all the steps of the sound control procedure outlined below will be adopted for this event.

3.1.2 A team consisting of one sound management consultant will be working at the event. Details for the consultant will be provided to the local authority prior to the events. The consultant will be contactable at any time during the licenced period on the site communication radio and/or by mobile phone.

3.1.3 The sound management consultant will liaise with the team of audio engineers based at the stage and operators of any approved smaller sound systems around the site (including the fairground rides). The audio engineers will work under the instruction of the consultant and put in to place any required alterations to the sound systems overall or frequency-based output to achieve compliance with the premises licence conditions and agreed MNL limits. The event management will be kept updated with regard to the off-site noise levels throughout the event.

3.2 Sound Control Program

Pre-event Information

3.2.1 Within the two weeks before the event BJP will contact local residents of noise sensitive premises in writing detailing the community hotline telephone number, nature, timings of the programmed entertainment and propagation tests of the event. The letter/flyer will be sent out to a list of properties to be agreed with Chelmsford City Council (CCC).

Noise Curfew

3.2.2 Noise from the operation of sound systems for regulated entertainment will not take place before 12:00 on the event days and will be programmed to finish by 22:30. However, sound checks using low levels of white/pink noise, clicks/tones and microphone checks for sound system set-up, line checking and time alignment may take place on the Saturday mornings. Sound system tuning and propagation tests will occur

on the morning of the events not before 09:00. These sound checks will be kept to a minimum length of time.

Sound Propagation Tests and Sound System Set-up Checks

3.2.3 The following schedule of sound system set-up, tuning and propagation tests will occur for the events:

- 09:00 to 10:00 – Line checking, set-up and sound system alignment. No music, only white/pink noise and clicks.
- 10:00 to 12:00 - Sound system tuning time, and artist sound checks, music allowed.
- 10:00 to 12:00 - Sound system propagation tests to set starting sound levels at the stages.

3.2.4 The sound propagation tests consist of playing music, similar to the programmed artists, through the sound systems and measuring the MNLs at fixed monitoring points to be used throughout the event in the front of house (FOH) area, ideally at the mixing position where located FOH, for each of the stages. Concurrent off-site measurements at selected NSRs will also be taken for each stage to allow identification of any potential problems from individual stages at individual NSRs. These tests take account of all physical factors (e.g. distance, ground absorption, air absorption and meteorological conditions) such that the on-site operating levels can be adjusted and set to achieve compliance with the off-site licence conditions before the start of the event.

Sound Monitoring and Control

3.2.5 BJP are to inform all relevant parties that F1AC are undertaking the sound control role as part of the license requirement and that this role has been appointed and approved by BJP. F1AC will have ultimate operational control over all the sound levels throughout the event. Therefore, all other parties, including artists, production managers, stage managers, sound engineers and event managers will be instructed not to increase any sound levels unless specifically agreed by the Lead Consultant responsible for sound control.

3.2.6 Off-site noise levels will be measured using Class 1 specification integrating sound level meters capable of measuring third-octave bands. Octave band measurements will be regularly taken at proposed monitoring positions as shown in Figure 1. The monitoring

positions identified with the highest MNLs will be monitored more frequently than those with a lower MNL. Additional monitoring positions may be added during the event.

3.2.7 If any MNLs are measured to be above the proposed MNL provided in Table 3.1, the sound engineer at the stage identified (or all stages if an individual stage cannot be easily identified) will be instructed to reduce the MNL, until a measurement showing compliance with the proposed MNL limits. In addition to the control of the overall sound level, frequency adjustments can also be made to reduce the sound at certain low frequencies, often characterised outside the event as a 'bass beat'.

3.2.8 Based on the national guidance document Code of Practice on Environmental Noise Control at Concerts (although withdrawn by the Chartered Institute of Environmental Health in 2019, it is still the most up to date guidance document available), timings and duration of the event and our expert experience of similar events we propose the MNL limits for this event are as presented in Table 3.1.

Table 3.1: Proposed Music Noise Level Limits

Location	Daytime 12:00 to 22:30
	Broadband $L_{Aeq,15min}$, dB
Sound monitoring location representative of a noise sensitive premises	65

3.2.9 Music noise and announcements from fairground rides will be closely monitored and controlled throughout the event so they do not exceed the proposed MNL limits at the nearest noise sensitive receptors.

3.2.10 Throughout the event, F1AC will be available to liaise closely with CCC Officers responsible for noise, if they are in attendance. If F1AC is made aware of MNLs approaching the set limits, sound levels at each stage where it is considered necessary will be reduced. Results of the off-site noise monitoring and any related actions will be collated and kept available by F1AC for inspection by the Local Authority at any time during the event.

Low Frequency Sound Control

3.2.11 Paragraph 3.4 from the Noise Council guidance provided in Section 1 states low frequency noise should also be considered separately to minimise the disturbance at NSRs. Notes on Paragraph 3.4 indicate that the onset of significant disturbance is

between 70 dB and 80 dB (unweighted). Note 1 of Paragraph 3.4 states that it is the frequency imbalance that causes the disturbance and 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.

- 3.2.12 The frequency imbalance occurs because the distance attenuation of sound is frequency dependent, with lower (bass) frequencies attenuating at a slower rate than higher frequencies. The distance at which this frequency imbalance becomes noticeable is generally between 1 – 2 km.
- 3.2.13 At NSRs closer to the site than the onset of the frequency imbalance the L_{Aeq} MNL limit specified in the Premises Licence will take in to account the low frequency component of the music noise. At these NSRs the music noise will contain the full frequency range without significant imbalance, subsequently controlling the A-weighted limit will also control the low frequency component of the MNL.
- 3.2.14 The assessment of the MNL at the NSRs will include a subjective assessment for any frequency components or featured elements that may cause undue disturbance (including low frequency music noise). In the event that an undue disturbance is identified, appropriate adjustments will be actioned at the relevant stage(s).
- 3.2.15 Table 3.2 shows the target low frequency MNL limit that, based on our expert experience of similar events, will be applied at noise sensitive receptors where the low frequency component of the music noise is dominant, likely to be at a distance greater than 1 km from the event.

Table 3.2: Target Low Frequency Music Noise Limit

Location	Daytime 12:00 to 22:00
	63 Hz and 125 Hz Octave Bands $L_{Zeq,15min}$, dB
Sound monitoring location representative of a noise sensitive premises where low frequency music noise is dominant	70

Community Hotline and Response to Complaints

- 3.2.16 A dedicated community hotline, the telephone number of which will be published as aforementioned in Paragraph 3.2.1, will be available for residents from 10:00 to 22:30 on event days. All complaints will be logged and those relating to noise will immediately

be relayed to the Lead Consultant with details, where provided, of the complainant's name, address and postcode, telephone number and a description of the disturbance.

- 3.2.17 Should any complaints of noise be received, at any time during the event or sound propagation tests, a Consultant from the sound control team will visit the complainants address and take a measurement. If MNLs are measured to be above the proposed limit immediate action will be taken on-site to reduce the level from the event. This will be achieved by two-way radio or mobile phone communication with all persons involved with the sound control procedures, thus a quick response to the problem can be actioned. However, from experience, it has been found that this pro-active sound control procedure will prevent the limits from being exceeded in the first place. Results of complaint investigation monitoring and any related actions will be collated and kept available by F1AC for inspection by the Local Authority at any time during the event.

Post-event Report

A post-event report will be available one week after each event including a summary of the off-site noise levels measured throughout the event; actions taken as a result of the measurements; complaints received; complaint investigation measurements; and any actions taken as a result of complaint investigation.

4 Music Noise Level Sound Propagation Predictions

4.1 Methodology

- 4.1.1 Sound propagation predictions have been undertaken using ISO 9613 'Acoustics – Attenuation of sound during propagation outdoors' as implemented by SoundPLAN 8.2 sound modelling software. The ISO 9613 predictions of the St Clere Estate (London Road) site have taken into account the attenuation from geometrical divergence, atmospheric absorption and ground effect between the selected stage and the nearest noise sensitive receptors surrounding the event site.
- 4.1.2 Mapping of the festival site has been supplied by BJP with additional surrounding mapping and topography data acquired from the Ordnance Survey Open Data website.
- 4.1.3 Typical variable atmospheric conditions have been considered to be a temperature of 15°C and 70 % relative humidity for the assessment. The attenuation from ground effect has been calculated based on porous ground at the source, middle and receiver areas, water and roads have been considered as hard ground.
- 4.1.4 Downwind propagation has been assumed in all directions for the purposes of the noise predictions.
- 4.1.5 The sound system has been input using d&b audiotechnik ArrayCalc software to model representative speaker systems and set-ups appropriate for the stage. This includes proposed trim heights, stage width, subwoofer layout and configuration. The detailed sound system directivity patterns are directly imported to the SoundPLAN model which uses this data to predict sound levels from individual speakers.
- 4.1.6 All receivers positioned at the monitoring positions are at 1.5 m above ground level. Grid noise maps have been calculated at 1.5 m above ground level.

4.2 Source Input Music Noise Levels

- 4.2.1 Music frequency spectrums measured by F1AC at similar events have been used as the input for the sound system. The frequency spectrum is considered representative of the typical music at this event. The input spectrum is shown in Table 4.1.

Table 4.1: Source Input Music Noise Level Frequency Spectrum

Stage	Octave Band $L_{Zeq,T}$, dB							
	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
Main Stage & Stage 3	113	101	97	95	94	90	88	86
Stage 2	112	97	97	95	94	90	88	86

4.2.2 For the purpose of the sound propagation predictions the broadband front of house MNL at 20 m in front of the main stage has been set as $L_{Aeq,15min}$ 96 dB, the broadband front of house MNL at 15 m in front of the second stage has been set as $L_{Aeq,15min}$ 94 dB. and the broadband front of house MNL at 10 m in front of the third stage/Carnival Truck has been set as $L_{Aeq,15min}$ 93 dB.

4.3 Music Noise Level Prediction Results

4.3.1 The results of the MNL sound modelling predictions are presented in Appendix B and Figure 3.

4.3.2 The prediction methodology used predicts downwind propagation in all directions for all sources at the same time, this may result in the off-site music noise levels being over predicted compared to the real-world, as the stage is at a different angle to each receptor it would not be possible for a every receptor to be directly downwind. The results should therefore be considered a worst-case scenario.

4.3.3 Detailed sound system design will be carried out in conjunction with the appointed sound system providers before the event to ensure the actual sound systems used at the event are optimized to minimise the off-site sound propagation, including low frequency propagation.

4.3.4 The sound prediction results demonstrate that it is feasible to operate the stages at Matt's BBQ with reasonable MNL at the stages while maintaining compliance with the proposed MNL criteria at the nearest noise sensitive receptors.

Figures



Legend

- ★ Monitoring Point
- ★ Stage

REV	DATE	D	R	DESCRIPTION
0	30/06/2021	RB	RM	Issue

F1:Acoustics
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PROJECT:	Matt's BBQ 2021 – Noise Management Plan
CLIENT:	BJP Productions Limited
TITLE:	Site Location and Nearest Noise Sensitive Receptors
DATE:	30/06/2021
REVISION:	0
SCALE:	As shown.
DRAWING NO:	1604/NMP/1/0
FIGURE NO:	1
DRAWN BY:	Rupert Burton
REVIEWED BY:	Robert Miller



Key

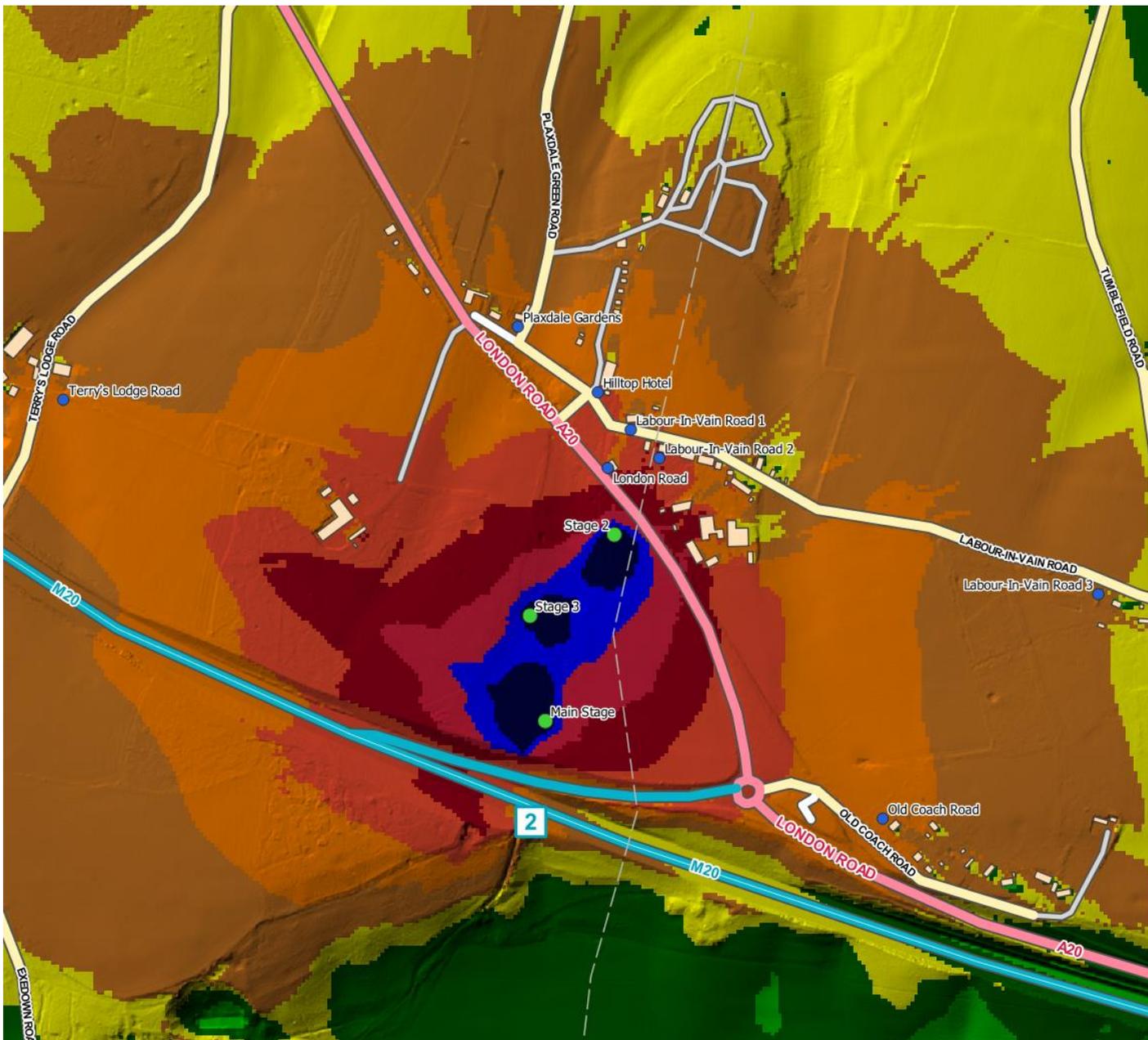
 Sound system location and direction

REV	DATE	D	R	DESCRIPTION
0	30/06/2021	RB	RM	Issue

F1:Acoustics

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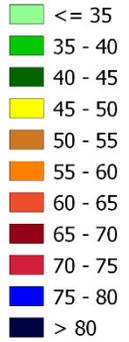
PROJECT:	Matt's BBQ 2021 – Noise Management Plan
CLIENT:	BJP Productions Limited
TITLE:	Example Site Plan
DATE:	30/06/2021
REVISION:	0
SCALE:	As shown.
DRAWING NO:	1604/NMP/2/0
FIGURE NO:	2
DRAWN BY:	Rupert Burton
REVIEWED BY:	Robert Miller



Key

- Noise Sensitive Receptor
- Stages

Predicted music noise level
 $L_{Aeq,15min}$ (dB) at 1.5 m AGL



REV	DATE	D	R	DESCRIPTION
0	30/06/2021	RB	RM	Issue

F1:Acoustics

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PROJECT:	Matt's BBQ 2021 – Noise Management Plan
CLIENT:	BJP Productions Limited
TITLE:	Music Noise Level Prediction Grid Map
DATE:	30/06/2021
REVISION:	0
SCALE:	Not to scale.
DRAWING NO:	1604/NMP/3/0
FIGURE NO:	3
DRAWN BY:	Rupert Burton
REVIEWED BY:	Robert Miller

Appendices

Glossary of Acoustic Terms

Noise is defined as unwanted sound. The range of audible sound is from 0 dB to 140 dB. The frequency response of the ear is usually taken to be about 18 Hz (number of oscillations per second) to 18,000 Hz. The ear does not respond equally to different frequencies at the same level. It is more sensitive in the mid-frequency range than at the lower and higher frequencies, and because of this, the low and high frequency component of a sound are reduced in importance by applying a weighting (filtering) circuit to the noise measuring instrument. The weighting which is most used and which correlates best with the human subjective response to noise is the A-weighting. This is an internationally accepted standard for noise measurements.

The ear can just distinguish a difference in loudness between two noise sources when there is a 3 dB difference between them. Also when two sound sources of the same noise level are combined the resultant level is 3 dB higher than the single source. When two sounds differ by 10 dB one is said to be twice as loud as the other.

The subjective response to a noise is dependent not only upon the sound pressure level and its frequency, but also its intermittency. Various indices have been developed to try and correlate annoyances with the noise level and its fluctuations. The indices and parameters used in this report are defined below:

- **Background Noise Level** – The prevailing sound level at a location, measured in terms of the $L_{A90,T}$, on an equivalent day and at an equivalent time when no concert or sound checks are taking place.
- **dB(A)** – The A-weighted sound pressure level whereby various frequency components of sound are weighted (equalized) to reflect the way the human ear responds to different frequencies.
- **L_{Aeq}** – The equivalent continuous sound pressure level which at a given location over a given period of time contains the same A-weighted sound pressure level of a steady sound that has the same energy as the fluctuating sound under investigation.
- **$L_{AN,T}$** – The A-weighted sound level exceeded for N% of the measurement period (T).
- **Music Noise Level (MNL)** – The L_{Aeq} of the music noise measured at a particular location.
- **Noise Consultant** – A person given responsibility by the organiser of the event for monitoring noise levels in accordance with the prevailing conditions, and who has the ability and authority to make decisions and implement changes in noise level during the event.

Music Noise Level Prediction Results**Table B.1: Music Noise Level Prediction Results at the Nearest Noise Sensitive Receptors**

Location	Broadband Sound Level, L_{Aeq,15min}, dB	Octave Band Sound Level L_{Zeq,63Hz,15min}, dB	Octave Band Sound Level L_{Zeq,125Hz,15min}, dB
Hilltop Hotel	61	80	64
Labour-In-Vain Road 1	61	78	63
Labour-In-Vain Road 2	63	82	65
Labour-In-Vain Road 3	51	72	50
London Road	65	83	68
Old Coach Road	57	74	57
Plaxdale Gardens	56	77	63
Terry's Lodge Road	56	80	59