



Brockwood Festival 2024

Noise Management Plan

Brockwood Entertainment Ltd

Revision 0

16 February 2024

Role	Name	Position	Signature	Date
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Reviewer	Rupert Burton BSc (Hons) MIOA	Director	[Redacted Signature]	16/02/2024

Revision	Date	Reason
0	16/02/2024	First draft.

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1 Introduction

1.1 Appointment

1.1.1 F1 Acoustics Company Limited (F1AC) has been appointed by Brockwood Entertainment Ltd (BEL) to provide sound control and management for the Brockwood Festival event to be held on Friday 12th and Saturday 13th July 2024 at Brockwood Park, Bramdean, Alresford, Hampshire, Winchester, SO24 0LQ.

1.1.2 This Noise Management Plan (NMP) contains details of the noise management strategies, staffing levels, control methodologies and procedures that will be implemented by F1AC on behalf of BEL for the Brockwood Festival event to ensure that the licensing objectives for the prevention of public nuisance are promoted.

1.2 About F1 Acoustics Company Limited

1.2.1 F1AC are specialists in event and festival sound control and have provided services for festivals including Glastonbury, Boomtown, Leeds, Latitude, Kendall Calling, South West Four Weekender and Printworks London plus numerous other single stage and multi-stage events across the UK. We have a combined experience of over 30 years providing high quality sound control services. All of our Consultants are Members of the Institute of Acoustics. As well as entertainment sound control the company deals with a large range of acoustics and noise issues 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.

1.2.2 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 protocol for sound control is established.

1.3 Premises Licence

1.3.1 A Premise Licence application has been submitted to Winchester City Council (WCC). The following conditions relating to music noise have been proposed by the event organiser:

“The Premises Licence Holder shall produce an initial Noise Management and Community Liaison Plan at least 56 days prior to the commencement of the event. The final NMP shall be submitted to the Licensing Authority for agreement no later than 28 days prior to the commencement of the event. No alteration to the NMP after this date shall be made by the Premises Licence Holder except with the written consent of the Licensing Authority.

The final NMP shall contain the methodology which shall be employed to control sound produced on the premises, in order to comply with the premises licence. The NMP must include all of the arrangements for preventing public nuisance and consultation with the local community and shall include:

- An inventory of all sound systems to be used on the site.*
- A schedule of contact details for those who are responsible for the sound systems.*
- A list of stages together with sound power output details, a schedule of their location, orientation and shut down times and their maximum audience capacity.*
- Maximum permitted sound power output details for traders.*
- Management command and communication structure /methods for ensuring that permitted sound system output and finish times are not exceeded.*
- Publication and dissemination of information to the public and complaints.*
- Action to be taken by the Event Organiser following complaints.*

The Premises Licence Holder shall ensure compliance with all aspects of the Noise Management and Community Liaison Plan.

At least 14 days prior to an event the Premises Licence Holder shall provide to the licensing authority a telephone number for contacting the licence holder or a nominated representative during the course of an event.

The Premises Licence Holder shall produce and make available a Public Information Document with details of arrangements for the event based on the EMP and NMP that might affect the local community. The contents of the document and required distribution list are to be agreed with the Licensing Authority at least 28 days in advance of each event. The final agreed Public Information Document shall be distributed to recipients as agreed at least 14 days prior to the event.

Between the hours of 1200 and 2300 on Friday and Saturday, broadband music noise levels from the event shall not exceed 60dB L_{Aeq} (15 mins) and music noise levels in octave band frequency ranges with a centre frequency of 63 Hz and 125 Hz shall not exceed 65dB L_{Zeq} (15 mins).

Between the hours of 2300 and 0200 on Friday night to Saturday morning and Saturday night to Sunday morning, broadband music noise levels from the event shall not exceed 45dB L_{Aeq} (15 mins) and music noise levels in octave band frequency ranges with a centre frequency of 63 Hz and 125 Hz shall not exceed 60dB L_{Zeq} (15 mins).

All music noise levels shall be measured as above in free-field conditions and in the absence of significant local noise sources at locations to be agreed in writing with the Licensing Authority no later than 28 days in advance of the event.

The sound systems of the principal stages shall be tested to ensure compliance with the above levels prior to the commencement of the event. The Licensing Authority shall be notified no less than 24 hours in advance of such testing being undertaken.

The Premises Licence Holder shall appoint a competent noise consultant to monitor and record on site and off site noise, to ensure compliance with music noise level limits.

The Premises Licence Holder shall not permit amplification equipment to be brought onto the site unless:

- it is for use as part of regulated entertainment; or*

- *it is for the use of authorised traders for the sole purpose of providing ‘incidental’ or background music to their stall or fairground attraction.*

The Premises Licence Holder shall submit a post event Noise evaluation report to the Licensing Authority no more than 28 days after the end of the event. This shall include:

- *The event complaint log including names, addresses, dates, times and details of complaint and action, taken in response to each.*
- *The event noise log, including dates, times, locations of noise monitoring).*
- *An explanation for any breaches of licensing conditions and any action that was taken to avoid breaching the music noise level criteria.*
- *A summary of what action can be taken to improve noise control and management, if appropriate.”*

1.4 Code of Practice on Environmental Noise Control at Concerts

- 1.4.1 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.”

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

2 Site, Environs and Details of the Event

2.1 Site Location

2.1.1 The event site is at Brockwood Park, Bramdean, Alresford, Hampshire, Winchester, SO24 0LQ. The nearest noise sensitive premises to the main stage are within Brockwood Park (School, The Krishnamurti Centre, Cottages and The Gatehouse) with the closest being 375 m, properties on the A272 at 665 m, the village of Bramdean at 1.3 km and properties on Brockwood Bottom at 550 m. A plan showing the festival site location, surrounding area and the noise sensitive premises is included as Figure 1.

2.1.2 The character of the area is rural. The main environmental noise sources in the area will be those associated with a rural environment, with noise sources including road traffic on the A272 and local road network, and natural environmental sources including wind in the trees and animals.

2.2 Brockwood Festival 2024

2.2.1 The Brockwood Festival 2024 event will be held on Friday 12th and Saturday 13th July 2024, with two stages.

2.2.2 The type of music being performed at the event is electronic dance music incorporating various genres including drum n bass, house and techno. The opening and closing times of the two stages at the event are detailed in Table 2.1 below and are located as shown in the site layout plan provided in Figure 2.

Table 2.1: Stage Details

Stage	Operating Times	
	Friday	Saturday
1 - Woodland	12:00 - 02:00	12:00 - 02:00
2 – Port Arthur	12:00 - 23:00	12:00 - 23:00

2.2.3 F1AC has discussed the orientation and location of the stages with EEL to maximise the benefits of the site layout with regard to the off-site NSRs, i.e. with the rear of the stage facing towards the closest receptors thus utilising the inherent directivity of the sound systems where possible. Straw bales will be utilised behind the stages to provide additional screening mitigation for the music noise levels at the nearest noise sensitive receptors.

2.2.4 The sound systems will have appropriate controls for adjusting and fine-tuning individual third octave-bands. A multi-band compressor/limiter or dynamic EQ will also be used on the sound systems to provide greater control of the sound level output and will be used as necessary. The only people with access to change the settings on the compressors/limiters will be members of the sound engineering team.

Traders and Concessions

2.2.5 Traders will be informed before the event that the maximum power rating of the sound system they may bring on to the event site is 200 W (RMS). The traders will be monitored throughout the event days and music noise levels reduced if they have increased unnecessarily or are causing a disturbance.

Sound System Details and Sound Propagation Predictions

2.2.6 For the two stages, sound system specifications are provided in Appendix B. MNL sound propagation predictions have been carried out using SoundPLAN 9.0 3D sound modelling software for the late night Woodland stage. The methodology, assessment and results of the sound propagation predictions are also reported in Appendix B.

3 Sound Control Procedure

3.1 Personnel

3.1.1 To ensure the noise objectives contained within the Premises Licence are achieved, all the steps of the sound control procedure outlined below will be adopted. Such procedures have been developed over a number of years and successfully implemented at numerous concerts, festivals and all-night events. It is anticipated that staff carrying out the sound control program will work closely with the Local Authority Officers before and during the events.

3.1.2 A team consisting of one sound control consultant will be working at the event. They will be working to control the sound throughout the opening times of the stages.

3.1.3 The project manager responsible for the event sound control will be Robert Miller BSc (Hons) MIOA(E). Robert has over 15 years of experience running sound control for events large and small at both indoor and outdoor venues. The consultant attending the event and/or Robert will be contactable at any time during the licence period on the site communication radio and/or by mobile phone.

3.1.4 The sound control team will liaise with the team of audio engineers based at the main stage and operators of any approved smaller sound systems around the site (e.g. traders). The audio engineers will work under the instruction of the sound control team and put in to place any required alterations to the sound systems overall or frequency based output to achieve compliance with the proposed MNL limits.

3.2 Sound Control Program

Pre-event Information

3.2.1 Prior to the event, BEL will contact local residents of noise sensitive premises detailing the community hotline telephone number and email address, nature, timings of the programmed entertainment, sound checks and propagation tests of the event. However, it is the intention of the noise management plan to control noise levels such that complaints do not arise.

Build and Breakdown

- 3.2.2 The build and breakdown will occur in the days before and after the event. In order to limit any additional noise experienced by local residents causing a disturbance F1AC have been informed by BEL that any build or breakdown activities that are considered noisy will only take place between the hours of 08:00 and 20:00 Monday to Saturday and between the hours of 10:00 and 18:00 on a Sunday.

Noise Curfew

- 3.2.3 Noise from the operation of sound systems for entertainment will only take place before between 12:00 and 02:00 on the event days. Sound system set-up tests and sound checks may occur for a maximum of one hour per stage on Thursday afternoon (between 12:00 and 20:00) or Friday morning (between 08:00 and 12:00) which will give the sound system engineers a chance to run the systems at a higher level, before the event begins. Sound checks may also occur on Saturday morning for a maximum of one hour (between 08:00 and 12:00).

Sound Propagation Tests

- 3.2.4 Sound propagation tests will be carried out on Thursday afternoon (between 12:00 and 20:00) or Friday morning (between 08:00 and 12:00).
- 3.2.5 The sound propagation tests consist of playing music, similar to the programmed artists, through the sound system and measuring the MNL at a fixed monitoring point to be used throughout the event in the front of house (FOH) area, ideally at the mixing position if located FOH. Off-site measurements at the nearest identified NSRs will also be taken for each stage to allow identification of any potential problems from the stage 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

- 3.2.6 BEL are to inform all relevant parties that F1AC have ultimate operational control over all the sound levels throughout the event. Therefore, all other parties, including artists, production managers and sound engineers will be instructed not to increase any sound levels unless specifically agreed by the consultant responsible for sound control.

3.2.7 Off-site noise levels will be measured using a Class 1 specification integrating sound level meter capable of measuring third-octave bands. Sound level measurements will be regularly taken at proposed monitoring positions as shown in Figure 1. The monitoring positions identified with the highest music noise levels will be monitored more frequently than those with a lower music noise level. Additional monitoring positions may be added during the event.

3.2.8 If any levels are measured to be above the proposed MNL limit, provided in Table 3.1, the sound engineer at the stage will be instructed to reduce the MNL, until a measurement showing compliance with the conditions can be taken. 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’.

Table 3.1: Proposed Music Noise Level Limits

Location	Daytime 12:00 to 23:00 MNL Limit Broadband $L_{Aeq,15min}$, dB	Night-time 23:00 to 02:00 MNL Limit Broadband $L_{Aeq,15min}$, dB
Music noise level monitoring position representative of any noise sensitive premises	60	45

3.2.9 On-site measurements will be taken with a sound level meter at FOH to keep the operating sound levels under control. By measuring on-site sound levels at the stages, we will reduce the amount of sound level creep and ensure that off-site levels will remain below the MNL limits.

3.2.10 The wind speed and direction have a large influence on which monitoring positions may be experiencing the highest MNL from the event and which stages may be causing the MNL that are audible off-site. F1AC will review the wind speed and direction regularly for planning the control of MNL across the festival site.

3.2.11 Throughout the event, F1AC will liaise closely with Local Authority Officers responsible for noise, if they are in attendance at the event. If F1AC is made aware of MNL approaching the limits, sound levels at the stage 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

- 3.2.12 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 noise sensitive premises. 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.
- 3.2.13 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.
- 3.2.14 Table 3.2 shows the proposed low frequency MNL limit that, based on our experience of similar events, will be applied at noise sensitive premises.

Table 3.2: Proposed Low Frequency Music Noise Level Limit

Location	Daytime 12:00 to 23:00	Night-time 23:00 to 02:00
	63 Hz and 125 Hz Octave Band $L_{Zeq,15min}$, dB	63 Hz and 125 Hz Octave Band $L_{Zeq,15min}$, dB
Music noise level monitoring position representative of any noise sensitive premises	65	60

- 3.2.15 The assessment of the MNL at the noise sensitive premises 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).

Community Hotline and Response to Complaints

- 3.2.16 A dedicated community telephone hotline and email address, which will be published as aforementioned in Paragraph 3.2.1, will be staffed throughout the duration of the event, in the event that any complaints are received regarding, amongst other matters, noise. All complaints will be logged and those relating to noise will immediately be relayed to the sound control consultant with details, where provided, of the complainant’s name,

address and postcode, telephone number and a description of the disturbance by radio, messaging application, email or mobile phone.

- 3.2.17 Should any complaints of noise be received, at any time during the event or sound propagation tests, the sound control consultant will visit the complainant address and take a measurement. If MNL are measured to be above the 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 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 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

- 3.2.18 A post-event report will be provided within 28 days, including a summary of the on-site and 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. However, if requested earlier, the results of any measurements can be made available to the Local Authority within two working days of the request being received by F1AC.

Figures



Legend

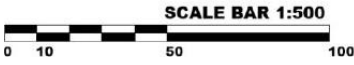
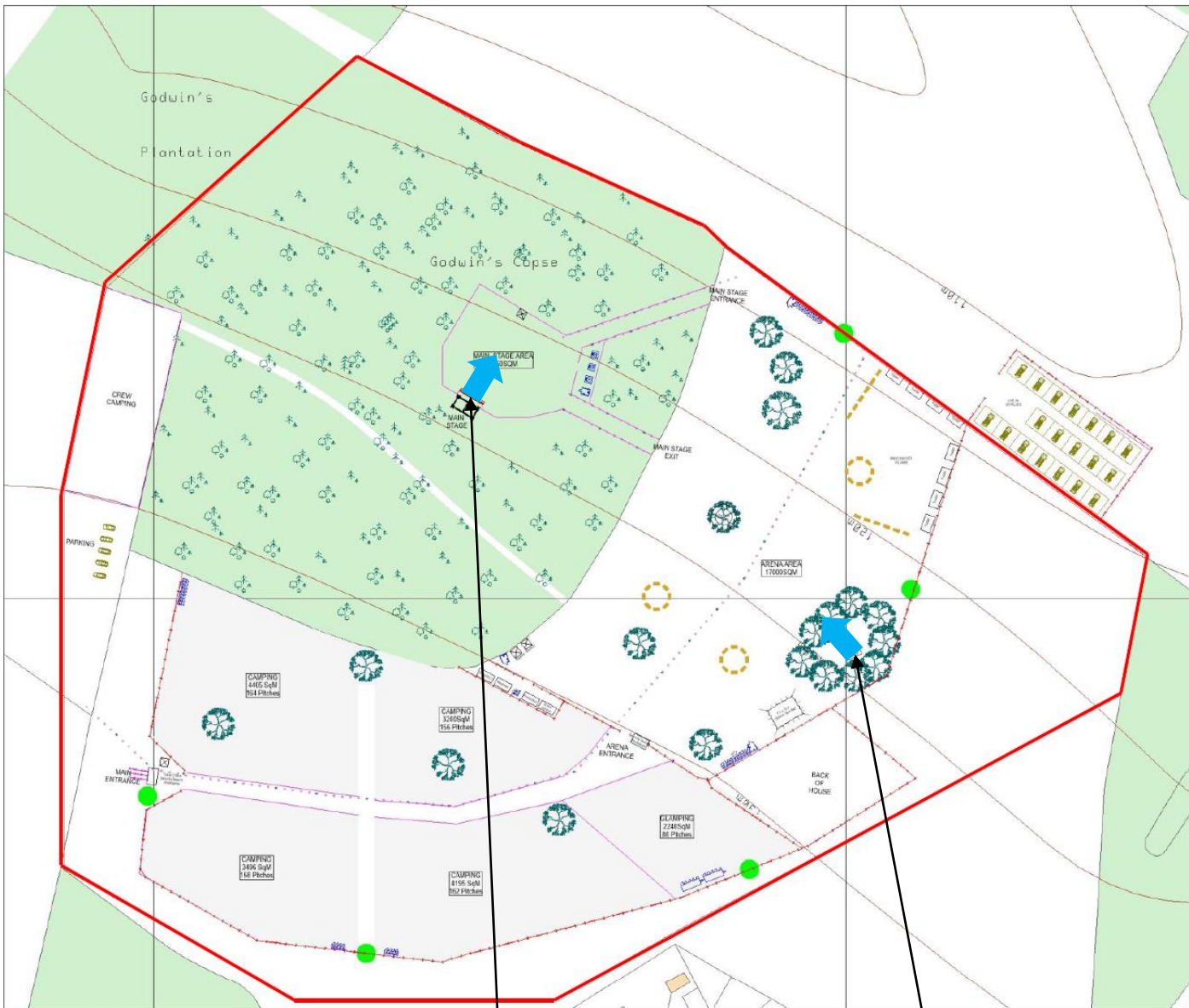
- Desensitised Premises
- Noise Sensitive Premises
- ★ Stage

REV	DATE	D	R	DESCRIPTION
0	16/02/2024	RM	RB	Draft

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PROJECT:	Brockwood Festival 2024 – Noise Management Plan
CLIENT:	Brockwood Entertainment Ltd
TITLE:	Stages and Proposed Music Noise Level Monitoring Positions
DATE:	16/02/2024
REVISION:	0
SCALE:	As shown.
DRAWING NO:	1902/BF24-NMP/1/0
FIGURE NO:	1
DRAWN BY:	Robert Miller
REVIEWED BY:	Rupert Burton


Google Earth



Woodland Stage

Port Arthur Stage

Key

 Sound system direction

REV	DATE	D	R	DESCRIPTION
0	16/02/2024	RM	RB	Draft

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PROJECT:	Brockwood Festival 2024 – Noise Management Plan
CLIENT:	Brockwood Entertainment Ltd
TITLE:	Site Layout
DATE:	16/02/2024
REVISION:	0
SCALE:	As shown.
DRAWING NO:	1902/BF24-NMP/2/0
FIGURE NO:	2
DRAWN BY:	Robert Miller
REVIEWED BY:	Rupert Burton

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:

- **L_{Aeq}** - Equivalent Continuous Sound Pressure Level The A-weighted sound pressure level of a steady sound that has, over a given period, the same energy as the fluctuating sound under investigation.
- **L_{AN}** - The A-weighted sound level exceeded for N% of the measurement period.
- **L_{Amax}** - The maximum A-weighted noise level recorded during the measurement period.
- **MNL** - The Music Noise Level is the L_{Aeq} of the music noise measured at a particular location.

Appendix B

Sound System Details and Sound Propagation Predictions

MUSIC NOISE LEVEL SOUND PROPAGATION PREDICTIONS

Project	Brockwood Festival 2024
To	Brockwood Entertainment Ltd
Author	Robert Miller, Director, F1 Acoustics Company Limited
Reference	1902/BF24-SoundSystemPropagation-TechnicalMemo/Rev0

1 INTRODUCTION

F1 Acoustics Company Limited (F1AC) has been appointed by Brockwood Entertainment Ltd (BEL) to provide late-night music noise level (MNL) computer modelling of the proposed Woodland stage at Brockwood Festival 2024 at Brockwood Park, Bramdean, Alresford, Hampshire, Winchester, SO24 0LQ. The noise modelling and this technical memo seek to demonstrate that the event can operate with an appropriate on-site MNL for the audience whilst complying with the proposed off-site MNL limits at noise sensitive premises.

2 MUSIC NOISE LEVEL CRITERIA

The proposed MNL limit at night (23:00 to 02:00) for the Brockwood Festival event at the nearest noise sensitive premises is a broadband $L_{Aeq,15min}$ 45 dB and octave bands 63 Hz and 125 Hz $L_{Zeq,15min}$ 60 dB.

3 MUSIC NOISE LEVEL SOUND PROPAGATION PREDICTION METHODOLOGY

Sound propagation predictions have been undertaken using ISO 9613 'Acoustics – Attenuation of sound during propagation outdoors' as implemented by SoundPLAN 9.0 sound modelling software. The ISO 9613 predictions of the event site have taken into account the attenuation from geometrical divergence, atmospheric absorption and ground effect between the selected stages and the noise prediction positions surrounding the event site representative of the nearest noise sensitive premises.

Mapping of the event site has been supplied by the client with additional surrounding mapping acquired from the Ordnance Survey Open Data website. Topographical DTM data has been obtained from the Environment Agency Open Government online.

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 has been considered as hard ground.

Downwind propagation has been assumed in all directions for the purposes of the noise predictions.

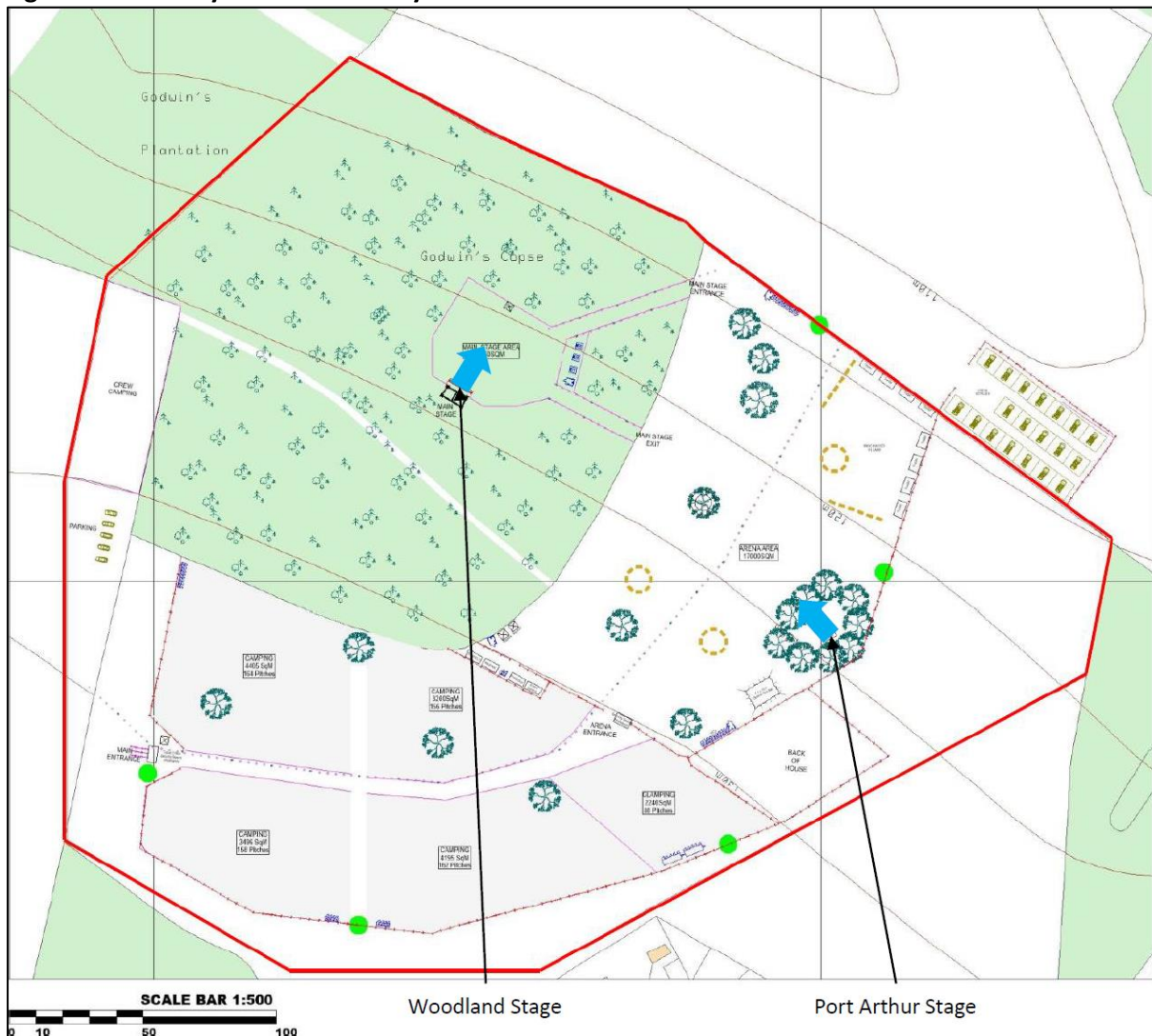
Sound systems have been approximated and input using d&b audiotechnik ArrayCalc software to model representative speaker systems and set-ups appropriate for each stage. This includes proposed trim heights; the stage width; subwoofer layout; and any specific subwoofer configuration. The detailed 3D sound system directivity patterns are directly imported to the SoundPLAN model which uses this data to predict sound levels from individual speakers at the noise receptors.

4 EVENT AND SOUND SYSTEM INFORMATION

Event Site

The event site includes an outdoor main stage and a smaller tented second stage. The site layout, stage locations and sound system orientations are shown in Figure 4.1.

Figure 4.1: Site Layout and Sound System Locations



Sound Systems

The following sound system details have been confirmed by the sound system supplier and are used in the noise model for the Woodland stage:

Main Stage – Woodland (3 kW RMS) – Curfew 02:00

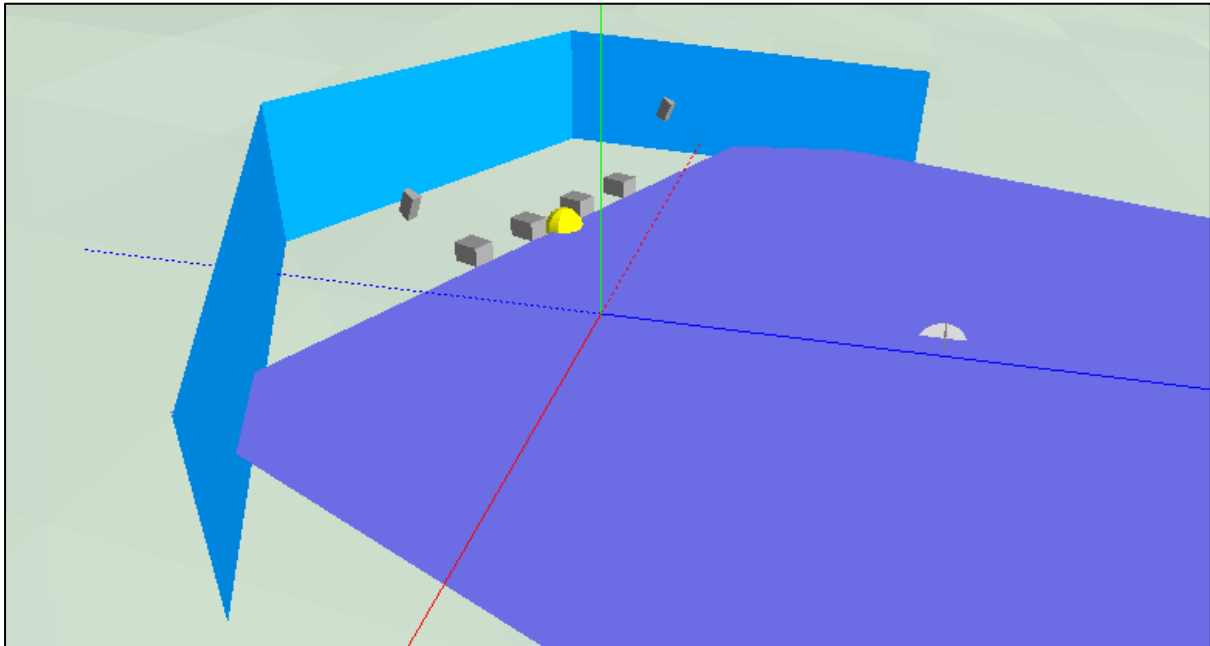
- 2x d&b Y10P Mid and Top L&R, 2 m high (angled down), 10 m apart.
- 4x d&b B4-SUB – Subwoofer array, 4 locations, evenly spaced over 6 m.

Second Stage – Port Arthur (3 kW RMS) – Curfew 23:00

- 2x d&b Y10P Mid and Top L&R, 2 m high (angled down), 10 m apart.
- 4x d&b B4-SUB – Subwoofer array, 4 locations, evenly spaced over 6 m.

A 3D render of the modelled Woodland stage sound system with 3m high straw bale walls for screening is provided in Figure 4.2.

Figure 4.2: 3D Render of Modelled Woodland Stage Sound System



Noise Model Receptors

The MNL have been predicted at positions representative of the nearest noise sensitive premises and are shown in Figure 4.3 and in the 3D render of the SoundPLAN model shown in Figure 4.4.

Figure 4.3: Noise Model Receptors

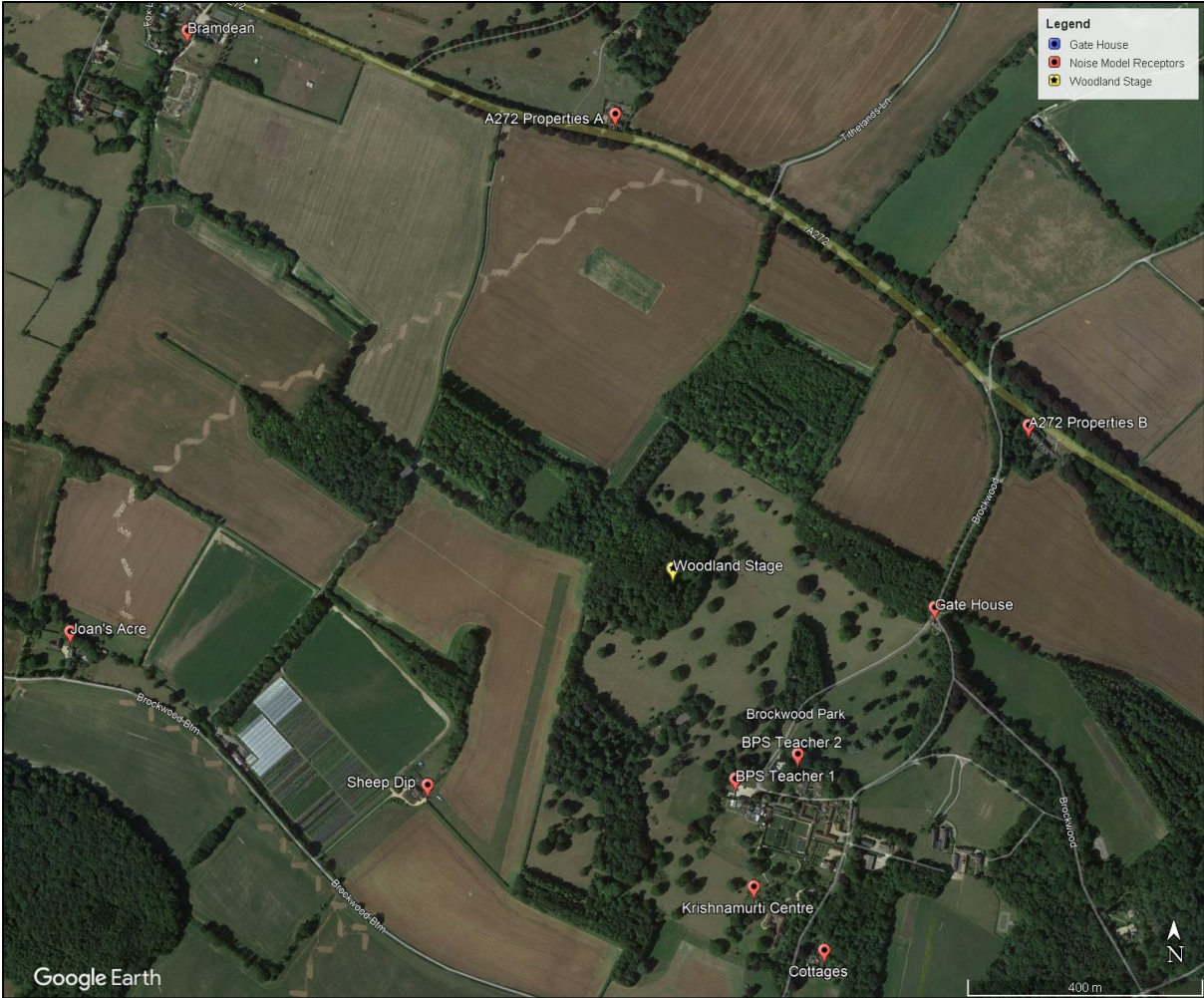
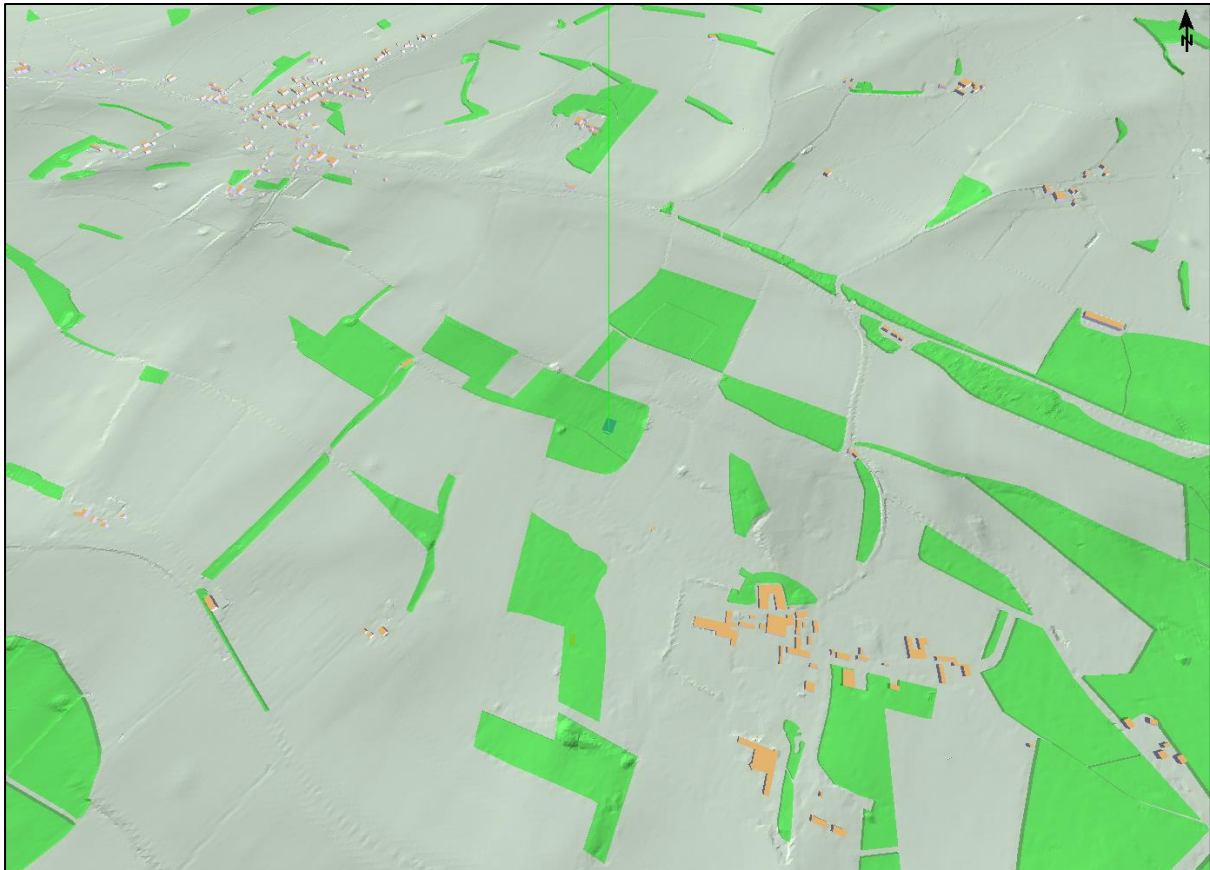


Figure 4.4: 3D Image of the SoundPLAN Model



The point receivers are positioned at 1.5 m above local ground level.

Source Input Music Noise Levels

A music frequency spectrum sourced from the SoundPLAN library (Electronic music, with a reduction of 11 dB at 80 Hz and below) has been used as the input for the sound system. The frequency spectrum is considered representative of the typical type and genre of music at this event. The input spectrum is shown in Table 4.1.

Table 4.1: Source Input Music Noise Level Frequency Spectrums

Stage	Octave Band $L_{Zeq,T}$, dB							
	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
Woodland Stage FOH @ 10m (95 dBA)	102	92	88	89	91	88	86	85

The frequency spectrum given in Table 4.1 has been normalised so the front of house sound levels modelled are $L_{Aeq,15min}$ 95 dB at 10 m in front of the Main Stage at 1.5 m above local ground level.

5 MUSIC NOISE LEVEL PREDICTION RESULTS

The results of the MNL propagation predictions for the positions representative of the nearest noise sensitive premises are presented in Table 5.1 as broadband A-weighted and unweighted (Z-weighted) low frequency (bass) octave bands with centre frequencies of 63 Hz and 125 Hz.

Table 5.1: Music Noise Level Predictions

Location	Broadband $L_{Aeq,15min}$, dB	Octave Band 63 Hz $L_{Zeq,15min}$, dB	Octave Band 125 Hz $L_{Zeq,15min}$, dB
A272 Cottages 1	45.3	53.6	41.2
A272 Cottages 2	45.2	58.9	47.5
BPS Teacher Accom 1	37.8	42.4	49.2
BPS Teacher Accom 2	41.9	47.2	49.6
Bramdean	35.7	44.2	35.7
Cottages	27.8	36.8	38.5
Gate House	47.7	56.5	48.8
Joan's Acre	27.4	36.7	35.0
Krishnamurti Centre	32.1	38.3	44.2
Main Stage FOH 10m	95.0	101.9	92.0
Main Stage FOH 20m	89.2	96.3	84.0
Sheep Dip	30.0	38.8	39.3

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 each receptor is at a different angle to the stage it would not be possible for all receptors to be directly downwind of the stage at the same time. The results should therefore be considered a worst-case scenario at each receptor.

The sound prediction results demonstrate that it is feasible to operate the Brockwood Festival event at Brockwood Park with a reasonable MNL in the audience area considering the context and type of event, while maintaining compliance with the proposed off-site MNL limit at the nearest noise sensitive premises.

On-stage sound has not been considered in this modelling exercise although it will be kept to a minimum and were possible reduced to a single 200 W RMS speaker.