ROSSCO
P.A. & SOUND DESIGN

REPORT TITLE: NOISE MANAGEMENT PLAN IN RESPECT OF
SANDON FIELDS FESTIVAL 2020
HYDE HALL FARM, HERTFORDSHIRE SG9 0RU

ISSUED TO: Richard Maskell
London Road Studios
Unit 13
Baldock Industrial Estate
London Road
Baldock SG7 6NG

ISSUED BY: Matt Hine BSc (Hons) AMIOA

CHECKED BY: Ross Sharples AMIOA

DATE: October 2019

ROSSCO
P.A. & SOUND DESIGN

CONTENTS

ROSSCO
P.A. & SOUND DESIGN

SUMMARY

- Sandon Fields Festival is an annual family music event held in fields at Hyde Hall Farm.

- A Noise Management Plan has been designed for this year's Sandon Fields Festival 2020.

- The plan assesses music noise levels at the festival in order that agreeable entertainment is provided for festival goers whilst minimising disturbance of local residents.

- Calculations have been undertaken to predict noise levels at potential noise sensitive locations based on music levels at audience position within the festival site and assessed against guideline noise criteria.

- The assessment illustrates that where guideline noise criteria are adhered to, satisfactory and enjoyable music levels may be achieved for festival goers without adversely affecting the amenity of local residents.

- A methodology is provided for monitoring and controlling music noise levels during the festival together with a scheme for responding to complaints should they arise.

1. INTRODUCTION

Rossco Ltd. has been commissioned to provide and undertake a Noise Management Plan (NMP) for Sandon Fields Festival 2020 at Hyde Hall Farm, Hertfordshire SG9 0RU on Saturday 20th and Sunday 21st June 2020.

Rossco Ltd. have been designing and commissioning sound systems for temporary and permanent installation nationally and internationally for twenty years and have produced and applied approximately thirty Noise Management Plans for public events similar to Sandon Fields on behalf of licencees and in conjunction with local authorities including North, Mid and East Hertfordshire District Councils, Huntingdonshire District Council, Oxfordshire County Council, Tower Hamlets, City Of Westminster, Camden Council et al.

Rossco Team Members (RTMs) possess a wealth of event noise monitoring and/or sound production/music experience and include relevant Institute Of Acoustics and BSc Acoustics qualifications.

This NMP seeks to ensure guideline noise limits and criteria established by prior agreement with North Hertfordshire District Council Environmental Health Office are controlled during the course of the festival.

This NMP includes:

- Review of guideline noise level criteria;
- Description of the festival, site location and surrounding area;
- Assessment of predicted noise levels at Noise Sensitive Locations (NSL) against guideline noise levels;
- Noise monitoring survey methodology including complaints procedure.

2. GUIDELINE NOISE LEVEL CRITERIA

The Code of Practice on Environmental Noise Control at Concerts 1995 (The Code) is a document produced by a working party of professionals in the field known at the time as the Noise Council that is broadly adopted as a reference guide in controlling noise for events such as this. References will also be made to pertinent International / British Standards as required. Table 1 of The Code below sets out guideline Music Noise Levels (MNL) for different event scenarios:

Concert days per calendar year, per venue	**Venue Category**	**Guideline MNL; $L_{Aeq,15\ min}$**
1 to 3	Urban Stadia or Arena	≤ 75dB
1 to 3	Other Urban and Rural Venues	≤ 65dB
4 to 12	All Venues	≤ Background noise ($L_{A90,\ T}$) +15dB

Table 1: Table 1 of The Code; Guideline Music Noise Levels (MNL)

The following descriptions are also provided by The Code:

- MNLs are defined as free-field broadband $L_{Aeq,15\ min}$ levels not to be exceeded between the hours of 09:00 and 23:00 (day period) measured at pre-identified NSLs and additionally at any other unanticipated NSLs identified during the course of the festival;

- NSLs include residential properties, hospitals or similar institutions, education establishments, places of worship or any premises used for other purposes likely to be adversely affected by the music noise;

- MNLs should not include contributions from noise sources other than music from the event;

- For events occurring between the hours of 23.00 and 09.00 (night period) the music noise shall not be audible from within any noise sensitive premises with windows open for ventilation;

- At distances greater than 2km from the event, the free-field broadband $L_{Aeq,15\ min}$ at any NSL shall not exceed 70dBZ in either the 63Hz or 125Hz octave band.

The day period NML guideline value of 65dBA relating to "Other Urban and Rural Venues" taken from Table 1 of The Code is considered appropriate for this event.

This year's Sandon Fields festival features seven music stages, marquees and tents. The Main and London Road stages feature live acts and will both finish at 23:00 with the remaining five marquees/tents closing at 01:00 on Saturday. A VIP Lounge is scheduled to run until 02:00.

For times between 23:00 and 02:00, the more stringent night period MNL guideline limit suggested in The Code will be observed. This equates to an $L_{Aeq,15\ min}$ value of ≤ 45dBA MNL *outside* NSLs for this additional two/three hour night period. The night period $L_{Aeq,15\ min}$ ≤ 45dBA level is based on the following research:

- An acceptable ambient noise level inside a bedroom at night is given as $L_{Aeq,8\ hour}$ ≤ 30dB (BS 8233);

- Attenuation of an average window, slightly open for the purposes of ventilation is between 15 - 20dB (BS 8233 and NANR 116 "Open Window Research" carried out for DEFRA);

- Therefore, levels outside bedrooms of a NSL equate to a free-field $L_{Aeq,15\ min}$ of 45dB (i.e.: 30+15).

A summary of the maximum MNLs for both day and night periods proposed by this NMP and to be used at this year's Sandon Fields Festival 2020 subject to the agreement of the licensing authority is given below in Table 2:

Description		Maximum Guideline MNL
Day Period	09:00-23:00	≤ 65dB ($L_{Aeq,15\ min}$)
Night Period	23:00-23:30	≤ 45dB ($L_{Aeq,15\ min}$)

Table 2: Maximum Proposed MNLs for Sandon Fields Festival 2020

3. EVENT DESCRIPTION

This year's Sandon Fields Festival 2020 is a two day music event featuring both live and pre-recorded music, food, camping and activities for children.

The festival site occupies fields at Hyde Hall Farm. The nearest NSLs are NSL1 800m to the south, NSL2 1km to the east and NSL3 1km to the west. The closest residential property is 580m south-west of the site. This is not considered to be a noise sensitive location as it is understood the residents are supportive of and will be attending the festival (As they have the previous 2 years)

The 2020 festival site comprises one main live music stage projecting south, a second live stage (London Road Stage) projecting south-west, two dance tents, two smaller music venues and a VIP Lounge playing pre-recorded music. Cardioid subwoofer array type pa systems are to be employed, chosen for their low frequency directional characteristics and strategically positioned to reduce music noise levels at NSLs.

The smaller music venues and VIP Lounge will feature smaller acts not requiring large subwoofers to supplement sound. A site location plan indicating the NSLs together with site layout is given in Appendix A.

The festival is due to commence at midday on Saturday 13th June 2020. The live music stages will run until 23:00 and the other venues until 01:00. The VIP Lounge will close at 02:00. Sunday (14th) runs from midday until 19:30.

4. NOISE CALCULATIONS & PREDICTIONS

Tables 3 to 9 below and overleaf calculate projected day period free-field receiver music noise levels at NSLs based on maximum permissible music noise levels at the music venues within Sandon Fields Festival 2020 on Saturday 20th June:

Location	Main Stage	NSL 1	NSL 2	NSL 3
Distance from source (m)	25	850	1000	1000
Theoretical L_p @ 1m (dBA)	126	126	126	126
Distance Attenuation (dB)	-28	-59	-60	-60
PA Directivity Correction (dB)	0	-12	-6	-6
Ground Attenuation (dB)	0	-2	-2	-2
Barrier Attenuation (dB)	0	0	0	0
Free-field Receiver Music Noise Level (dBA)	98	53	58	58

Table 3: Projected free-field music noise levels arising from day period Main Stage music contributions

Location	London Road	NSL 1	NSL 2	NSL 3
Distance from source (m)	8	850	1000	1000
Theoretical L_p @ 1m (dBA)	114	114	114	114
Distance Attenuation (dB)	-18	-59	-60	-60
PA Directivity Correction (dB)	0	-12	-6	-6
Ground Attenuation (dB)	0	-2	-2	-2
Barrier Attenuation (dB)	0	0	0	0
Free-field Receiver Level (dBA)	96	41	46	46

Table 4: Projected free-field music noise levels arising from day period London Road music contributions

Location	Dance Tent 1	NSL 1	NSL 2	NSL 3
Distance from source (m)	8	850	1000	1000
Theoretical L_p @ 1m (dBA)	108	108	108	108
Distance Attenuation (dB)	-14	-59	-60	-60
PA Directivity Correction (dB)	0	-12	-6	-6
Ground Attenuation (dB)	0	-2	-2	-2
Barrier Attenuation (dB)	0	0	0	0
Free-field Receiver Level (dBA)	94	35	41	40

Table 5: Projected free-field music noise levels arising from day period Dance Tent 1 music contributions

Location Distance from source (m)	Dance Tent 2 8	NSL 1 850	NSL 2 1000	NSL 3 1000
Theoretical L_p @ 1m (dBA)	108	108	108	108
Distance Attenuation (dB)	-14	-59	--60	-60
PA Directivity Correction (dB)	0	-12	-6	-6
Ground Attenuation (dB)	0	-2	-2	-2
Barrier Attenuation (dB)	0	0	0	0
Free-field Receiver Level (dBA)	94	35	41	40

Table 6: Projected free-field music noise levels arising from day period Dance Tent 2 music contributions

Location Distance from source (m)	70s, 80s 5	NSL 1 850	NSL 2 1000	NSL 3 1000
Theoretical L_p @ 1m (dBA)	98	98	98	98
Distance Attenuation (dB)	-14	-59	-60	-60
PA Directivity Correction (dB)	0	-12	-6	-6
Ground Attenuation (dB)	0	-2	-2	-2
Barrier Attenuation (dB)	0	0	0	0
Free-field Receiver Level (dBA)	84	25	30	30

Table 7: Projected free-field music noise levels arising from day period 70s, 80s music contributions

Location Distance from source (m)	90s, 00s 5	NSL 1 850	NSL 2 1000	NSL 3 1000
Theoretical L_p @ 1m (dBA)	98	98	98	98
Distance Attenuation (dB)	-14	-59	-60	-60
PA Directivity Correction (dB)	0	-12	-6	-6
Ground Attenuation (dB)	0	-2	-2	-2
Barrier Attenuation (dB)	0	0	0	0
Free-field Receiver Level (dBA)	84	25	30	30

Table 8: Projected free-field music noise levels arising from day period 90s, 00s music contributions

Location Distance from source (m)	VIP Lounge 5	NSL 1 850	NSL 2 1000	NSL 3 1000
Theoretical L_p @ 1m (dBA)	98	98	98	98
Distance Attenuation (dB)	-14	-59	-60	-60
PA Directivity Correction (dB)	0	-12	-6	-6
Ground Attenuation (dB)	0	-2	-2	-2
Barrier Attenuation (dB)	0	0	0	0
Free-field Receiver Level (dBA)	84	25	30	30

Table 9: Projected free-field music noise levels arising from day period VIP Lounge music contributions

Table 10 below illustrates sum total projected day period free-field receiver music noise levels at the NLSs on the cautious and robust assumption that all music hosting venues are in operation simultaneously:

Location	NSL 1	NSL 2	NSL 3
Main Stage (dBA)	53	58	58
London Road (dBA)	41	46	46
Dance Tent 1 (dBA)	35	41	40
Dance Tent 2 (dBA)	35	41	40
70s, 80s (dBA)	25	30	30
90s, 00s (dBA)	25	30	30
VIP Lounge (dBA)	25	30	30
Total Free-field Receiver Music Noise Level (dBA)	53	58	58

Table 10: Total day period free-field music noise levels at the NSLs.

It can be seen from Table 8 that projected total day period music noise levels are within the guideline 65 dBA $L_{Aeq,15\ min}$ day period value at all NSLs as outlined in Section 2, Table 2.

Tables 11 to 15 below illustrate projected night period free-field receiver music noise levels at the NLSs for the additional two to three hour night period from 23:00 to 01:00 / 02:00:

Location Distance from source (m)	Dance Tent 1 8	NSL 1 580	NSL 2 1000	NSL 3 1000
Theoretical L_p @ 1m (dBA)	108	108	108	108
Distance Attenuation (dB)	-18	-59	-60	-60
PA Directivity Correction (dB)	0	-12	-6	-6
Ground Attenuation (dB)	0	-2	-2	-2
Barrier Attenuation (dB)	0	0	0	0
Free-field Receiver Level (dBA)	90	35	40	40

Table 11: Projected free-field music noise levels arising from night period Dance Tent 1 music contributions

Location Distance from source (m)	Dance Tent 2 8	NSL 1 580	NSL 2 1000	NSL 3 1000
Theoretical L_p @ 1m (dBA)	108	108	108	108
Distance Attenuation (dB)	-18	-59	-60	-60
PA Directivity Correction (dB)	0	-12	-6	-6
Ground Attenuation (dB)	0	-2	-2	-2
Barrier Attenuation (dB)	0	0	0	0
Free-field Receiver Level (dBA)	90	35	40	40

Table 12: Projected free-field music noise levels arising from night period Dance Tent 2 music contributions

Location Distance from source (m)	70s, 80s 8	NSL 1 580	NSL 2 1000	NSL 3 1000
Theoretical L_p @ 1m (dBA)	98	98	98	98
Distance Attenuation (dB)	-18	-59	-60	-60
PA Directivity Correction (dB)	0	-12	-6	-6
Ground Attenuation (dB)	0	-2	-2	-2
Barrier Attenuation (dB)	0	0	0	0
Free-field Receiver Level (dBA)	84	25	30	30

Table 13: Projected free-field music noise levels arising from night period 70s, 80s music contributions

Location Distance from source (m)	90s, 00s 8	NSL 1 580	NSL 2 1000	NSL 3 1000
Theoretical L_p @ 1m (dBA)	108	108	108	108
Distance Attenuation (dB)	-18	-59	-60	-60
PA Directivity Correction (dB)	0	-12	-6	-6
Ground Attenuation (dB)	0	-2	-2	-2
Barrier Attenuation (dB)	0	0	0	0
Free-field Receiver Level (dBA)	90	35	40	40

Table 14: Projected free-field music noise levels arising from night period 90s, 00s music contributions

Location Distance from source (m)	VIP Lounge 8	NSL 1 580	NSL 2 1000	NSL 3 1000
Theoretical L_p @ 1m (dBA)	108	108	108	108
Distance Attenuation (dB)	-18	-59	-60	-60
PA Directivity Correction (dB)	0	-12	-6	-6
Ground Attenuation (dB)	0	-2	-2	-2
Barrier Attenuation (dB)	0	0	0	0
Free-field Receiver Level (dBA)	90	35	40	40

Table 15: Projected free-field music noise levels arising from night period VIP Lounge music contributions

Table 16 below illustrates sum total projected night period free-field receiver music noise levels at the NLSs on the cautious and robust assumption that all music hosting venues are in operation simultaneously:

Location	NSL 1	NSL 2	NSL 3
Dance Tent 1 (dBA)	35	40	40
Dance Tent 2 (dBA)	35	40	40
70s, 80s (dBA)	25	30	30
90s, 00s (dBA)	25	30	30
VIP Lounge (dBA)	25	30	30
Total Free-field Receiver Music Noise Level (dBA)	39	44	44

Table 16: Total day period free-field music noise levels at the NSLs.

Table 16 illustrates that projected music noise levels are within the guideline 45 dBA $L_{Aeq,5\ min}$ night period value at all NSLs as outlined in Section 2, Table 2.

A Post Event Report for Sandon Fields 2020 with full details of all findings relating to music noise levels will be available within one calendar month of the event.

5. NOISE MONITORING METHODOLOGY

5.1 Before The Event

A letter is to be distributed to local residents warning them of the event, pointing out how it may affect their day. This may include higher levels of traffic and congestion in the locality and noise disturbance from either people passing by or amplified music.

This letter will outline a scheme designed for controlling noise and include the nature, date and timing of the event, number of consultants commissioned to respond and a complaints telephone number that can be called in the event of a noise complaint (relating to the event).

All Front of House (FOH) audio personnel will be briefed to ensure that they are entirely comfortable with having to work inside strict music noise level guidelines. The PA company must agree to adhere to noise limits as a condition of their engagement / contract. They will understand that they are to act on instructions from either the RTMs, any North Hertfordshire District Council representative or the Licensee without question in respect of noise attenuation, and under no circumstances breach limits.

5.2 Music Noise Level Monitoring During The Event

Three RTMs with BSc Acoustics, IOA diploma and/or relevant concert noise monitoring experience are assigned to undertake noise monitoring at the festival and will be present in or around site throughout the duration of the event. Each RTM will be equipped with a Class 1 sound level meter. The sound level meters are to be calibration-verified before and after the day's noise monitoring measurements using Class 1 calibrators.

RTM 1 is to be stationed permanently at FOH by the sound engineer throughout the entirety of the festival. RTM s 2 & 3 will monitor music noise levels at NSLs and be in transit between local residences responding and acting to any complaints should they arise.

Noise measurements are to be recorded principally as 15 minute samples of broadband L_{Aeq} values, with shorter measurement periods used for spot checks. Samples of octave band values will also be obtained by RTMs at NSLs.

For communication, each RTM will possess a two-way radio and mobile 'phone (as backup) to enable communication. In addition, one RTM will carry an additional two-way radio linking in to festival security staff enabling any complaints received by the telephone hotline to be quickly relayed and responded.

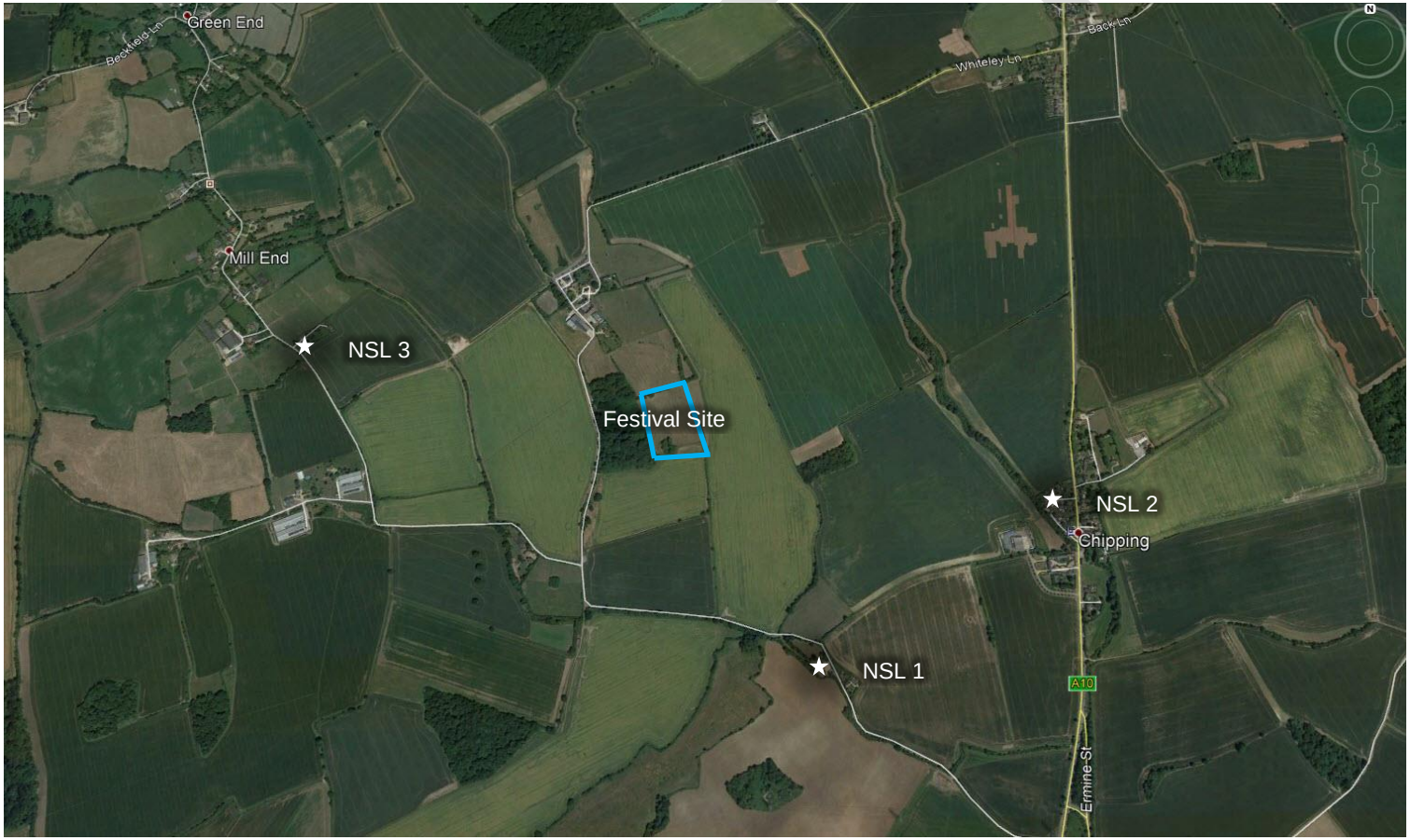
When action has been requested for the FOH sound engineer to attenuate levels, it shall be determined that this has been undertaken by RTM 1 observing an immediate reduction in the FOH $L_{Aeq,\ 1\ min}$ and/or $L_{Zeq\ \ 1\ min,\ 63\ \&\ 125Hz}$ and secondarily by seeking verbal confirmation from RTMs that levels are within limits at the NSLs.

5.3 Complaints Procedure

- Phone call from noise complaint received at permanently manned Event Control Centre;
- Control informs licensee and RMT;
- RTM attends the address/location of the complaint within a realistically prompt target time;
- RTM records MNL at the complaint location and takes remedial action as appropriate;
- RTM catalogues the complaint and reports back to the licensee;
- Control communicates with the complainant to report including any action undertaken;
- Control communicates with RTM again to close the case

APPENDIX A

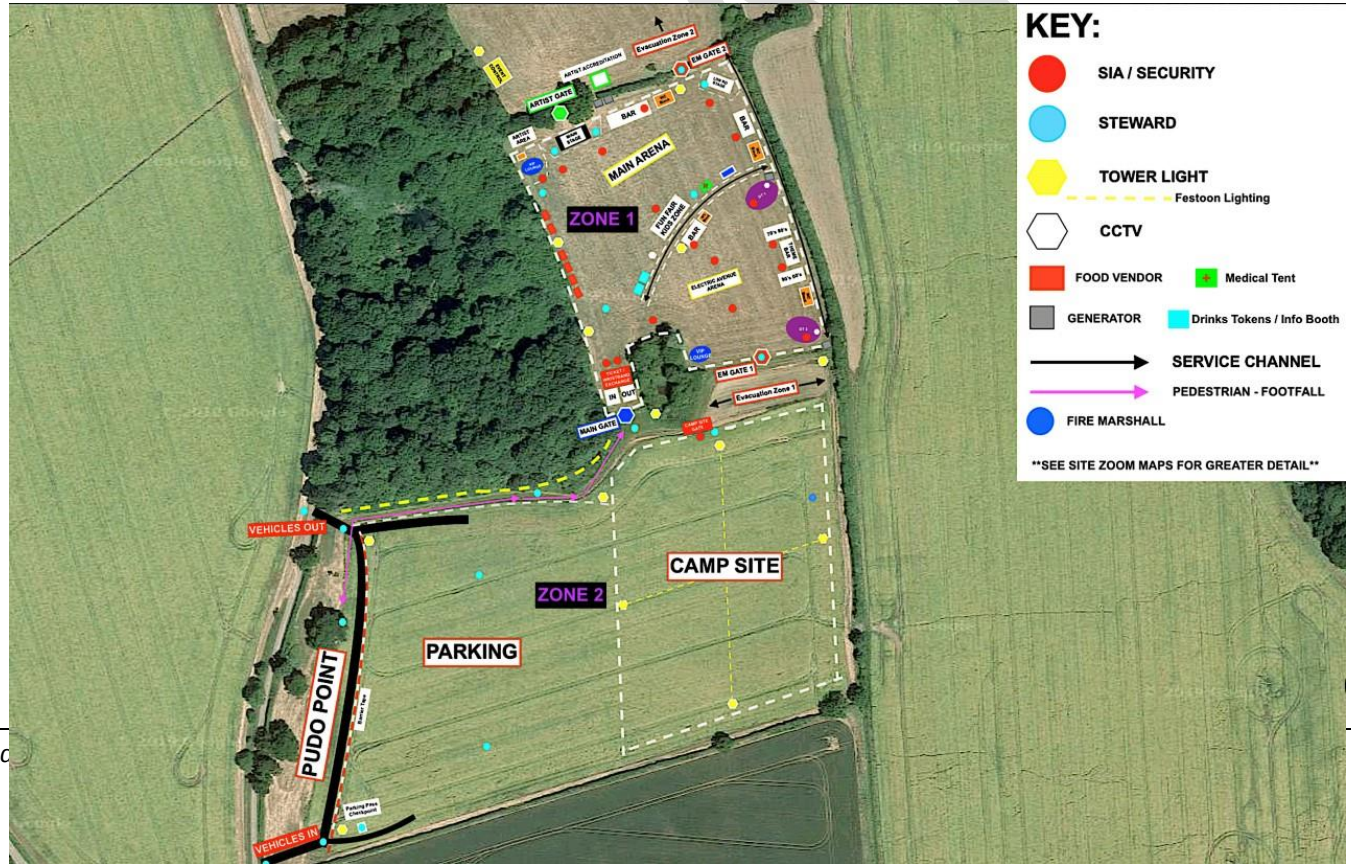
Site Location Plan & Noise Sensitive Locations



ROSSCO
P.A. & SOUND DESIGN

APPENDIX A

Site Layout



ROSSCO
P.A. & SOUND DESIGN

APPENDIX B
Acoustic Terms

B.1. The human ear detects sound (or "noise" if it is unwanted!) as pressure waves exert a force on the eardrum. The range of detectable forces is huge, from 0.00002 Pascals (the threshold of hearing) to 200 Pascals (the threshold of pain). It is thus condensed down to a manageable scale by expressing the logarithm of the ratio of the sound pressure to a reference sound pressure. This is the decibel: **dB**.

B.2. The human ear does not perceive all frequencies of sound with the same degree of sensitivity. It is less sensitive to very low and very high frequencies. To accommodate this perception in environmental monitoring an "A" weighting filter or "curve" is applied. This is expressed as **dB(A).**

B.3. Instantaneous noise level readings are of little use in determining the subjective response of the listener. A far more useful reading is an `average`. The parameter widely used in environmental monitoring is expressed as **dB(L_{Aeq}), *T***. ***L*** is the level, **A** is the weighting, "**eq**" is the "equivalent continuous sound pressure level that represents the same energy as the time varying noise under investigation" over the given period, "***T***".

B.4. Background Noise is defined as the A weighted sound pressure level of the residual noise ($L_{Aeq, T}$) excluding specific noises under investigation) at an assessment location that is exceeded for 90% of the stated time, `*T*`. (***L_{A90}*, *T***). It is thus a statistical parameter.

B.5. Level differences: We as humans can just detect a difference in loudness between two sources when there is a **3dB** difference. A **10dB** difference is perceived as a doubling (or halving) of level.

B.6. Examples of typical noise levels: