

TECHNICAL MEMO

Project	El Dorado Festival 2021 – Music Noise Level Predictions
To	Out Of Nowhere Limited
From	Robert Miller, Director, F1 Acoustics Company Limited
Date	26 February 2021
Reference	1528/TechnicalMemo/Rev0

1 INTRODUCTION

F1 Acoustics Company Limited (F1AC) has been appointed by Out Of Nowhere Limited to provide Music Noise Level (MNL) computer modelling of the proposed El Dorado Festival 2021 site layout at Eastnor Deer Park, Eastnor, Ledbury, Herefordshire, HR8 1RD.

2 MUSIC NOISE LEVEL CRITERIA

The existing Premises Licence contains three periods for MNL criteria at noise sensitive receptors. These MNL limits are presented in table 2.1 below.

Table 2.1: Existing Premises Licence Music Noise Level Criteria

Monitoring Location	Broadband $L_{Aeq,5min}$, dB		
	10:00 – 23:00	23:00 – 02:00	02:00 – 04:00 ¹
free field position at a noise sensitive premises (defined as 3.5 meters from any reflecting surface other than the ground at a height of 1.2 to 1.5 meters)	65	45	40

1 In addition between 02:00 and 04:00 Friday to Monday 'noise' from the festival should not be 'audible or discernible' within any occupied permanent structure where people normally reside or sleep.

3 MUSIC NOISE LEVEL SOUND PROPAGATION PREDICTIONS

Methodology

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 El Dorado site have taken into account the attenuation from geometrical divergence, atmospheric absorption, attenuation through foliage and ground effect between the selected primary stages and the noise monitoring positions surrounding the festival site.

Mapping of the festival site has been supplied by We Are The Fair 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 10°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 input using d&b audiotechnik ArrayCalc software to model representative speaker systems and set-ups appropriate for each stage in consultation with the sound system supplier RSH Audio. 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.

Sound system information used in the model is presented in Appendix A.

All receivers positioned at the monitoring positions are at 1.5 m above ground level. Grid maps have been calculated at 1.5 m above ground level.

Source Input Music Noise Levels

Music frequency spectrums measured by F1AC at El Dorado Festival 2019 for The Garden Stage headliners have been used as the input for The Garden Stage; and an average of El Paradisco and Cirque du Soul have been used as the input to all other sound systems. These frequency spectrums are considered representative of the typical music at this event. The input spectrums are shown in Table 3.1.

Table 3.1: 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
The Garden Stage	113	101	97	95	94	90	88	86
All Other Stages	106	97	95	95	90	85	83	82

The front of house sound levels modelled for each sound system during different time periods are shown in Appendix A.

4 MUSIC NOISE LEVEL PREDICTION RESULTS

To account for the time periods within the licence the results have been predicted for the maximum number of stages operating within the following three time periods: before 23:00, 23:00 to 02:00 and 02:00 to close. Stage opening periods are presented in Appendix A.

The results of the MNL sound modelling predictions are presented in Appendix B and Figures 1 to 3.

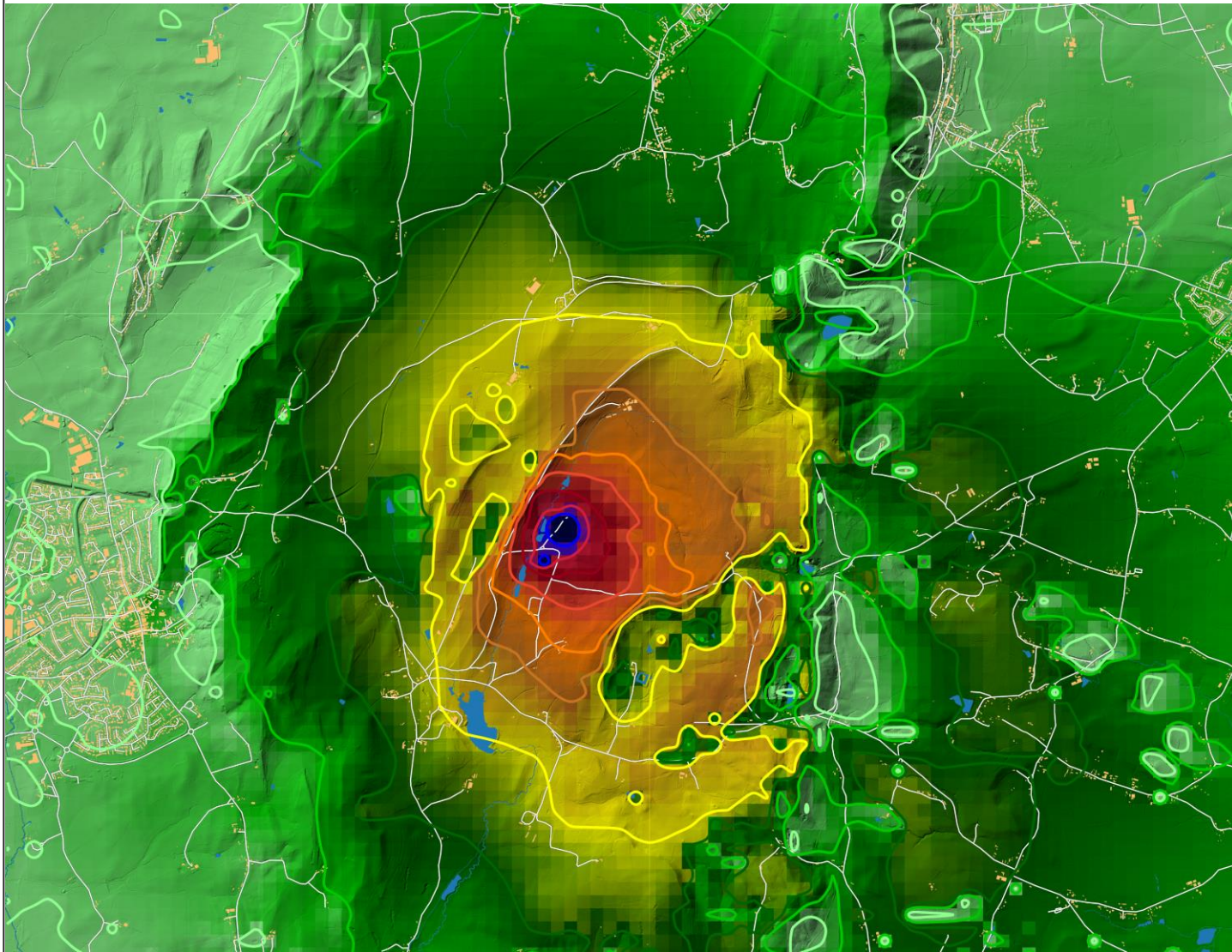
The prediction methodology used predicts downwind propagation in all directions for all sources at the same time, this may result in the off-site music noise levels being over predicted compared to the real-world, as each stage is at a different angle to each receptor it would therefore not be

possible for a receptor to be directly downwind of every stage. The results should therefore be considered a worst-case scenario.

As the prediction methodology predicts downwind propagation in all directions it is not possible to compare predicted sound levels with measured sound levels from previous events unless the receptor was downwind at the time of the measurement.

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. The noise model will be updated with the finalised sound system and site layout designs in the event specific Noise Management Plan.

The sound prediction results demonstrate that it is feasible to operate the El Dorado Festival at Eastnor Deer Park with reasonable MNL at the stages while maintaining compliance with the existing Premises Licence MNL criteria.



Key

- Surface Water
- Buildings
- Roads

Predicted MNL
at 1.5 m AGL
LAeq,T dB

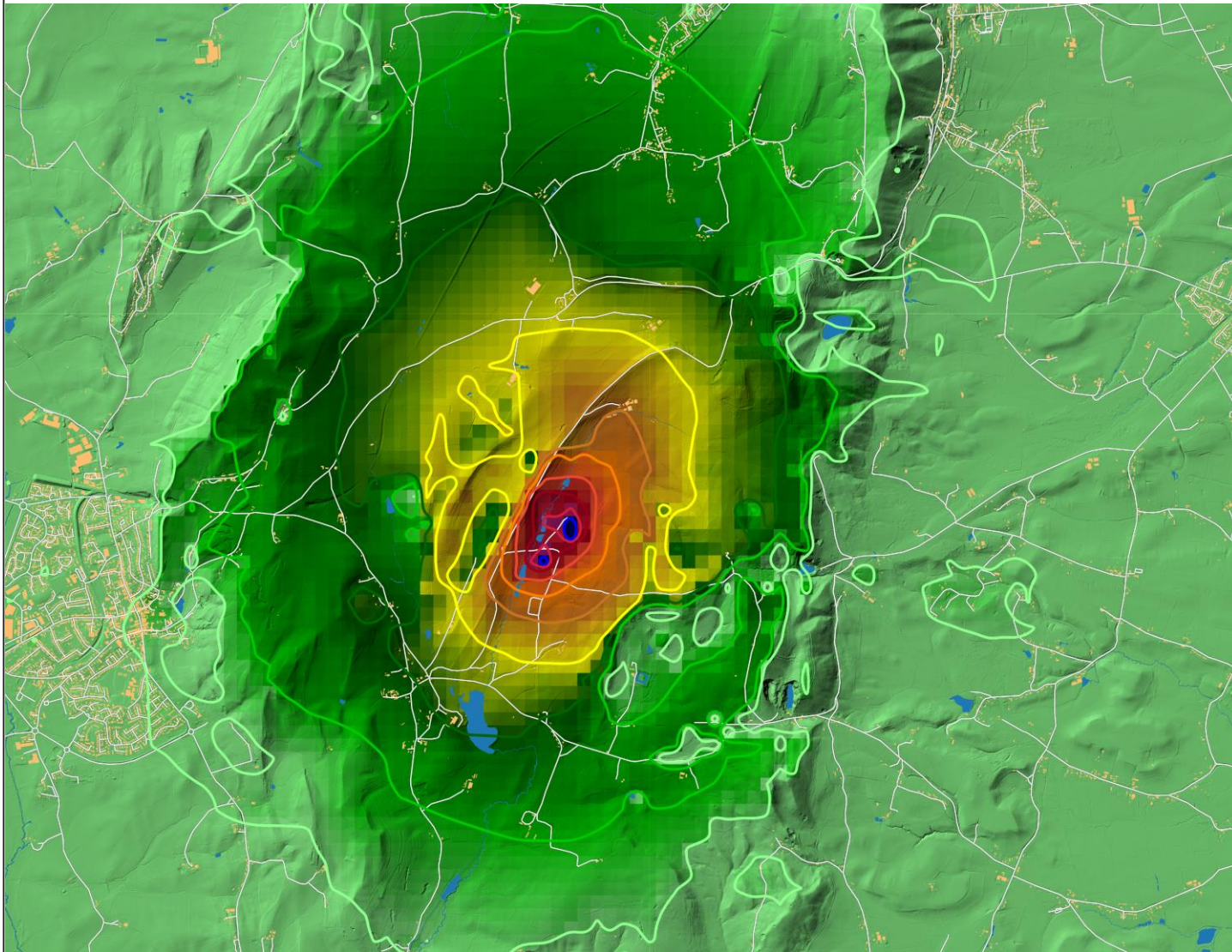
- 35
- 40
- 45
- 50
- 55
- 60
- 65
- 70
- 75
- 80
- 85

REV	DATE	D	R	DESCRIPTION
0	26/02/2021	RM	RB	Issue

F1:Acoustics

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PROJECT:	El Dorado Festival 2021 – Music Noise Level Predictions
CLIENT:	Out Of Nowhere Limited
TITLE:	El Dorado Festival 2021 – Music Noise Level Predictions Daytime (up to 23:00)
DATE:	26/02/2021
REVISION:	0
SCALE:	Not to Scale
DRAWING NO:	1528/1/0
FIGURE NO:	1
DRAWN BY:	Robert Miller
REVIEWED BY:	Rupert Burton



Key

- Surface Water
- Buildings
- Roads

Predicted MNL
at 1.5 m AGL
LAeq,T dB

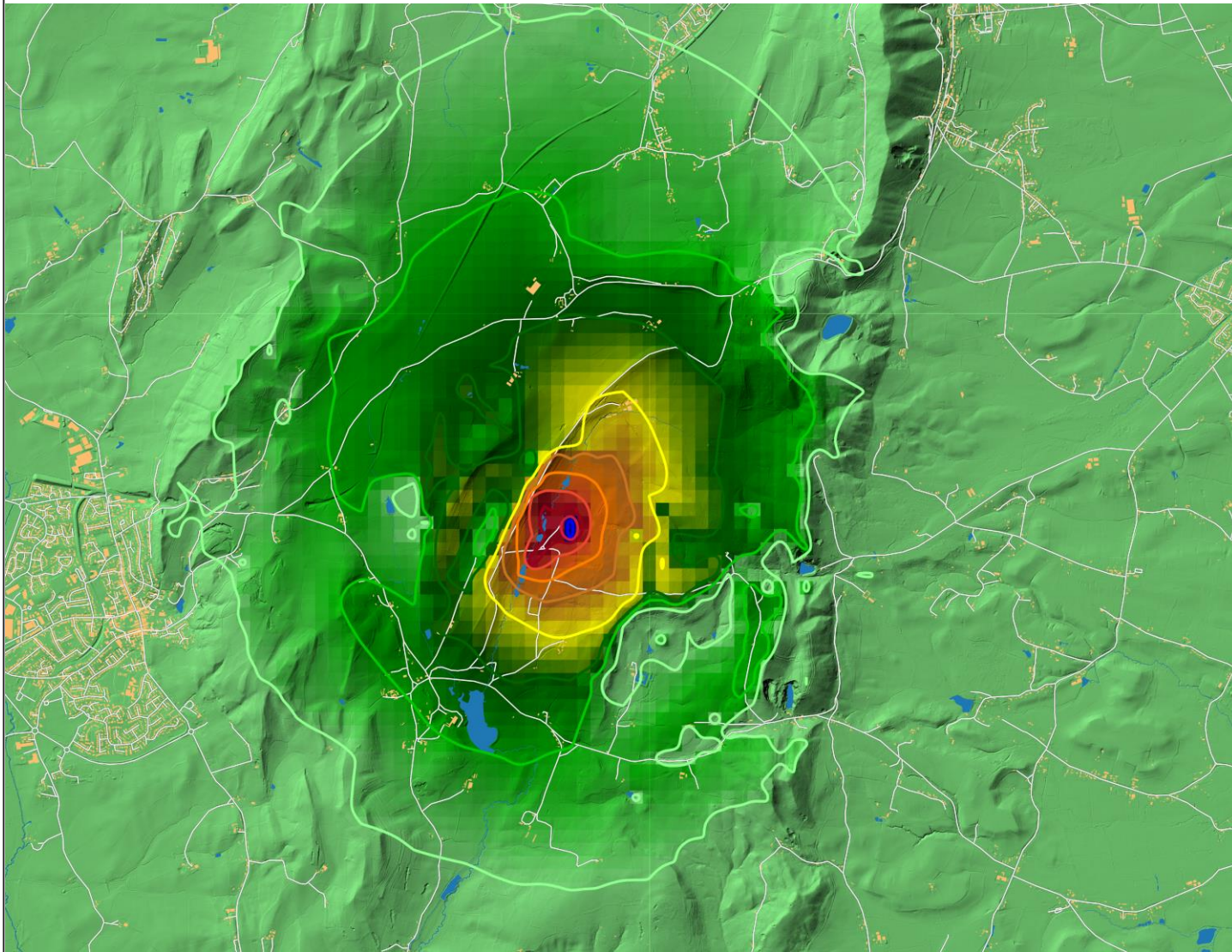
- 35
- 40
- 45
- 50
- 55
- 60
- 65
- 70
- 75
- 80
- 85

REV	DATE	D	R	DESCRIPTION
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PROJECT:	El Dorado Festival 2021 – Music Noise Level Predictions
CLIENT:	Out Of Nowhere Limited
TITLE:	El Dorado Festival 2021 – Music Noise Level Predictions Night-time (23:00 to 02:00)
DATE:	26/02/2021
REVISION:	0
SCALE:	Not to Scale
DRAWING NO:	1528/2/0
FIGURE NO:	2
DRAWN BY:	Robert Miller
REVIEWED BY:	Rupert Burton



Key

- Surface Water
- Buildings
- Roads

Predicted MNL
at 1.5 m AGL
LAeq,T dB

- 35
- 40
- 45
- 50
- 55
- 60
- 65
- 70
- 75
- 80
- 85

REV	DATE	D	R	DESCRIPTION
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PROJECT:	El Dorado Festival 2021 – Music Noise Level Predictions
CLIENT:	Out Of Nowhere Limited
TITLE:	El Dorado Festival 2021 – Music Noise Level Predictions Night-time (02:00 to 04:00)
DATE:	26/02/2021
REVISION:	0
SCALE:	Not to Scale
DRAWING NO:	1528/3/0
FIGURE NO:	3
DRAWN BY:	Robert Miller
REVIEWED BY:	Rupert Burton

Appendix A - Sound System Information

Table A.1: Stage Sound System Information and Source Music Noise Levels

ID	Stage	Category	Description	Tops (L&R)	Subs (L&R or Mono)	Fills (Total)	Spacing (L&R)	Reference Point (distance from sound system)	Source Spectrum	Timings	Sound Level $L_{Aeq,15min}$ at ref. point, dB	Sound Level $L_{Aeq,15min}$ at ref. point after 02:00, dB
S1	The Garden Stage	Main	Flown Line Array (L&R) Mono Sub	7x KSL8 2x KSL12	16x SL-SUB	4x V12	22 m	36 m	Garden Average	Day	99	-
S2	Cirque du Soul	Main	Flown Line Array (L&R) Mono Sub	6x V8	10x V-SUB		12 m	20 m	Cirque and Paradisco Average	Day and Night (after 02:00)	91	89
S3	El Paradisco	Main	Ground stacked Line Array (L&R) Mono Sub	6x V8	10x V-SUB	2x Y10P-40x110	10 m	20 m	Cirque and Paradisco Average	Day and Night (after 02:00)	96	91
S4	Mount Boom	Main	Ground stacked Line Array and Subs (L&R)	4x V8	3x V-SUB	2x Y10P-40x110	14 m	20 m	Cirque and Paradisco Average	Day and Night (up to 02:00)	90	-
S5	The Nest	Main	Ground stacked Line Array and Subs (L&R)	4x V8	3x V-SUB		8 m	20 m	Cirque and Paradisco Average	Day and Night (after 02:00)	92	87
S6	Treasure Island	Main	Ground Stacked Quad Point (L&R Front, L&R Rear)	1x V7P-75x40	2x V-SUB		15 m x 18 m	7.5 m	Cirque and Paradisco Average	Day	96	-
S7	Speak Easy	Small	Ground Stacked Point (L&R)	1x Y10P-110x40	1x V-SUB		6 m	12 m	Cirque and Paradisco Average	Day and Night (up to 02:00)	91	-
S8	Speak Easy Section 2	Small	Ground Stacked Point (L&R)	1x Y10P-110x40	1x V-SUB		6 m	12 m	Cirque and Paradisco Average	Day and Night (up to 02:00)	91	-
S9	The Sasscienda	Small	Ground Stacked Point (L&R)	1x Y10P-110x40	1x V-SUB		4 m	8 m	Cirque and Paradisco Average	Day and Night (after 02:00)	90	89
S10	Miami Street Stage Secret	Small	Ground Stacked Point (L&R)	1x Y10P-110x40	2x V-SUB		6 m	15 m	Cirque and Paradisco Average	Day and Night (after 02:00)	92	87
S11	Grandma's Secret Stage	Small	Ground Stacked Point (L&R)	1x Y10P-110x40	1x V-SUB		6 m	8 m	Cirque and Paradisco Average	Day and Night (after 02:00)	94	91
S12	Tipi Bar Stage	Background	Ground Stacked Point (L&R)	1x Y10P-110x40	2x V-SUB		6 m	15 m	Cirque and Paradisco Average	Day and Night (after 02:00)	85	85
S13	Wooden Stage	Background	Ground Stacked Point (L&R)	1x Y10P-110x40	1x V-SUB		6 m	12 m	Cirque and Paradisco Average	Day and Night (after 02:00)	85	85
S14	Clubhouse	Background	Ground Stacked Point (L&R)	1x Y10P-110x40	1x V-SUB		6 m	15 m	Cirque and Paradisco Average	Day and Night (after 02:00)	85	84
S17	Grandma's Living Room	Micro	Ground Stacked Point (L&R)	1x Y10P-110x40	1x V-SUB		4 m	8 m	Cirque and Paradisco Average	Day and Night (after 02:00)	92	89
S18	Savage Disco	Micro	Ground Stacked Point (L&R)	1x Y10P-110x40	1x V-SUB		6 m	8 m	Cirque and Paradisco Average	Day and Night (after 02:00)	92	92
S19	Good Life	Micro	Ground Stacked Point (L&R)	1x Y10P-110x40	1x V-SUB		6 m	8 m	Cirque and Paradisco Average	Day and Night (after 02:00)	92	92
S20	Miami Street Stage	Small	Ground Stacked Point (L&R)	1x Y10P-110x40	1x V-SUB		6 m	12 m	Cirque and Paradisco Average	Day and Night (after 02:00)	92	87
S21	Fantasy Tribe	Micro	Ground Stacked Point (L&R)	1x Y10P-110x40	1x V-SUB		6 m	8 m	Cirque and Paradisco Average	Day and Night (after 02:00)	92	92
B1	Bar 1	Background	Ground Stacked Point (L&R)	1x Y10P-110x40	1x V-SUB		6 m	12 m	Cirque and Paradisco Average	Day and Night (after 02:00)	85	85

Appendix B - Music Noise Level Predictions

Table B.1: Music Noise Level Predictions at Monitoring Locations

ID	Monitoring Location	Broadband $L_{Aeq,5min}$ dB		
		Day (up to 23:00)	Night (23:00 to 02:00)	Night (02:00 to 04:00)
1	Clenchers Mill Lane - Eastnor	47	43	39
2	Valentines Cottage - Hollybush	42	30	27
3	Caves Folly Nursery - Colwall	44	43	39
4	Hancocks Lane - Little Malvern	41	35	33
5	Rose Mead - Evendine	42	40	36
6	Oakland Drive - Ledbury	36	34	30
7	Worcester Road - Near Massington Lodge	46	45	40
8	Ledbury Road / Floyds Lane - Wellington Heath	37	36	31
9	Gullet Quarry	42	33	31