

**Butlin's Skegness  
Temporary Venue**

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**Noise Impact  
Assessment**

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**001**

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**January 2021**

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**Max Fordham LLP**  
Max Fordham LLP  
42/43 Gloucester Crescent  
London  
NW1 7PE

T +44 (0)20 7267 5161

maxfordham.com

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Registered in England and Wales  
Number OC300026.

Registered office:  
42–43 Gloucester Crescent  
London NW1 7PE

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## ISSUE HISTORY

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## **1.0 INTRODUCTION**

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This document is intended to provide acoustic context for the planning application for the introduction of a temporary entertainment venue at Butlin's Skegness.

The report covers relevant policies and guidance, a description and results of the long-term noise survey used to establish existing ambient and background noise levels at the site, as well as commentary on the likelihood of disturbance at NSRs from music noise within the temporary venue.

It should be read in conjunction with all other supporting which accompany this planning application

Max Fordham LLP Acoustics Team is a corporate member of the Association of Noise Consultants (ANC). A glossary of the common acoustic terms used in this report is given in Appendix A, for reference.

## **2.0 POLICY BASIS**

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### **2.1 National Planning Policy**

#### **National Planning Policy Framework, 2019**

Planning Policy Guidance Note 24 (PPG24), which was generally used for overall guidance to planners regarding environmental noise, particularly for residential sites, was replaced in March 2012 by the more general advice given in the National Planning Policy Framework (NPPF).

#### **Noise Policy Statement for England, 2010**

The Noise Policy Statement for England (NPSE) sets out (paragraph 1.6) the long term vision of Government noise policy: "Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development."

### **2.2 The Code of Practice on Environmental Noise Control at Concerts**

*The Code of Practice on Environmental Noise Control at Concerts*, produced by the Noise Council in 1990, is a design and management guide intended to minimise the impact of music noise from music venues. Among other guidance, it includes the following reference approximately matching the type of venue proposed in this case:

*For indoor venues used for up to about 30 events per calendar year an MNL not exceeding the background noise by more than 5dBA over a fifteen minute period is recommended for events finishing no later than 2300 hours.*

Although the proposed venue is proposed to be used for more than 30 events a year, the majority of these are to be entertainment shows, which have a lower likelihood of causing disturbance. The majority of pop music events are to take place in existing Butlin's venues. Adopting this criteria is therefore taken to be a conservative approach.

The document also contains this commentary on low frequency noise:

*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 measures.*

[...]

*A level of up to 70dB in either of the 63Hz or 125Hz octave frequency band is satisfactory; a level of 80dB or more in either of those octave frequency bands causes significant disturbance.*

These two criteria form the basis of the existing Butlin's noise management plan and will be used to assess the likelihood of disturbance from sound related to the proposed temporary venue.

### **3.0 EXISTING NOISE ENVIRONMENT**

#### **3.1 Noise Survey**

To assess existing noise levels at the site, an MFLLP engineer measured noise data in a position in an unused area of land towards the East of the site (marked in **Figure 1**) from 11<sup>th</sup>-13<sup>th</sup> December 2020 using a Class 1 Integrating Sound Level Meter. Details of calibration certificates for all relevant equipment can be found in an **Appendix B**.

Meteorological conditions were calm and cold throughout the survey period. Based on measurements taken at the closest available weather station in Selby, North Yorkshire, temperatures varied between 2-8°C. Only occasional, light rainfall was recorded at the weather station across the measurement period. Wind speeds at the did not exceed 1.2ms<sup>-1</sup>.

The survey location was chosen to be a similar distance from Roman Banks as the majority of the nearest NSRs, so as to provide background noise levels as similar as possible to as in those locations.



**Figure 1:** A site plan showing the site boundary of the Butlin's site in red, as well as the locations of the measurement positions, nearest noise sensitive receiver and the approximate location of the proposed venue. Imagery courtesy of Google.

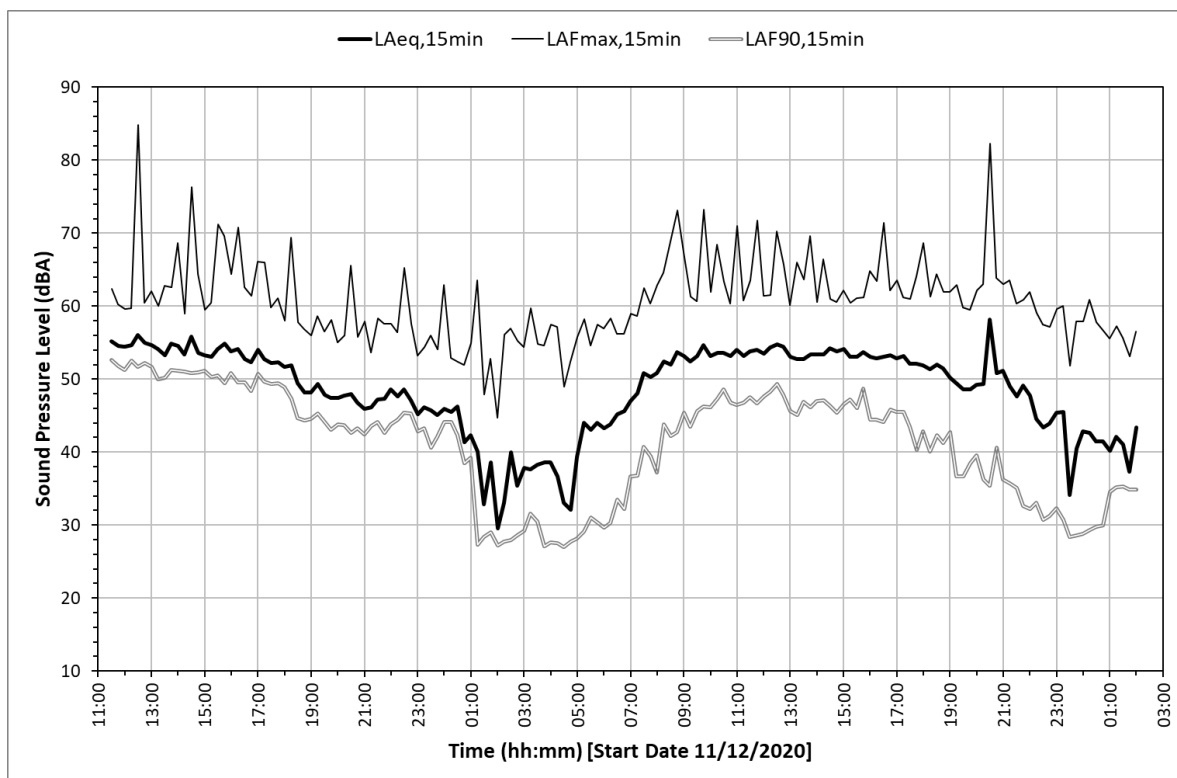


Figure 2: The noise levels measured during in the survey across the survey duration.

Daytime average	Night time average	Night time maximum	Daytime background	Night time background
<b>52dB</b>	<b>42 dB</b>	<b>60dB</b>	<b>44 dB</b>	<b>29 dB</b>
L <sub>Aeq</sub> ,16hr	L <sub>Aeq</sub> ,8hr	L <sub>AFmax</sub> ,15min 90th percentile	L <sub>AF90</sub> ,15min 40th percentile	L <sub>AF90</sub> ,15min 40th percentile
Note: Daytime covers the period 0700-2300, night time covers the period 2300-0700.				

Figure 3: A summary of the noise levels measured across the survey.

The measured noise levels are consistently relatively low, with the noise field dominated by the traffic on Roman Bank, to the West of the site.

As these measurements were taken during a period of “lockdown” to combat the spread of Coronavirus, no noise related to typical activity from the Butlin’s site is included within these measurements. In addition, traffic levels are likely to have been lower than they would typically be. As such, these noise levels may well be uncharacteristically low for this location.

Therefore, any analysis undertaken using these measurements as a baseline should be considered conservative and representative of the environment experienced during “lockdown” conditions.

The nature of this noise suggests that the level of noise measured at the measurement position is likely to be very similar to that at the façade of the nearby NSRs, with no correction for distance from the source required.

## **4.0 PREDICTED NOISE IMPACT**

Noise produced by the Butlin's site is managed by the Noise Management Plan, which will be amended to include the temporary venue utilising the same methodology and principles as the existing venues. The nature or character of noise produced by the site is not anticipated to change significantly as a result of the introduction of the temporary venue.

Noise limits at 1m from the Venue are shown here for reference only, and are not intended to be adopted as planning conditions, as, depending on the circumstances, it may be possible to achieve the levels at 1m from the noise sensitive receiver (NSR) with levels at 1m from the venue higher than those shown here.

The temporary venue shall operate only until 23.00hrs. The assessments below are undertaken on the basis of pop music events, which, as noted above, represent a worst-case scenario. The majority of events held in the temporary venue shall be less likely to cause negative impact than a standard pop concert.

A conservative prediction of the level difference between that at 1m from the façade of the venue to that 1m from the façade of the nearest noise sensitive receiver can be made using the standard distance correction,  $20\log_{10}(r)$ , where "r" is the distance between the two points.

### **4.1 Mitigating Factors**

The walls of the temporary structure are proposed to be formed of insulated panels – formed of a metal encapsulated mineral wool core – which are stated by the manufacturer to achieve a sound reduction index of **29dB R<sub>w</sub>**. This suggests the level difference provided by the walls of the temporary structure is around **27dB**.

As the proposed space shall be mechanically cooled and ventilated, doors and other openings will be closed during periods of occupation, so that these systems operate efficiently. The façade will therefore be sealed during performances, apart from brief periods when doors are opened to allow access.

The roof of the temporary structure is proposed to be formed of a stretched flexible layer. The position and directivity of the speakers used within PA system have been designed such that the majority of the sound energy is directed towards the audience, rather than upwards. The barrier effect of the side walls, in combination with the directivity of the PA systems, is predicted to be such that the sound passing through the roof of the venue does not reduce the apparent performance of the sound insulation provided by the insulated panels.

As such, it is anticipated that the level difference between inside the proposed venue and at 1m from the façade is likely to be in the region of **27dB**.

### **4.2 Impact to NSRs to the West**

The distance between the proposed site of the temporary venue and the nearest noise sensitive receiver to the West is around **160m**, which, using the standard distance correction, implies a level difference of **44dB**.

For these NSRs, the background level measured during the long-term survey is taken as representative. As noted above, decreased levels of traffic and activity noise during the Coronavirus restrictions make it likely that this is a conservative estimate of typical noise levels in this location.

In practice, the level difference will be significantly higher than this, as several structures within the Butlin's site – most notably the Skyline Pavilion, immediately to the west of the proposed location of the temporary venue – shall provide shielding to the noise sensitive receivers, reducing the noise level significantly. The additional level difference provided by this shielding is predicted to be at least **10dB**. Due to the uncertainty in this figure, however, it is not included in this assessment.

	63 Hz	125 Hz	A-w
<b>Measured Background Level</b>	-	-	44 dB L <sub>A90</sub>
<b>Limit at 1m from West NSR</b>	70 dB L <sub>eq</sub>	70 dB L <sub>eq</sub>	49 dB L <sub>Aeq</sub>
<b>Limit at 1m from Venue</b>	114 dB L <sub>eq</sub>	114 dB L <sub>eq</sub>	93 dB L <sub>Aeq</sub>

Figure 4: The measured background noise and derived limits for Music Noise Level (MNL) to comply with The Code of Practice on Environmental Noise Control at Concerts for NSRs to the West. Note that the 63Hz and 125Hz octave band limits are not based on the background level.

The Code of Practice on Environmental Noise Control at Concerts states:

*Research shows that the music level in the audience by the mixer position at pop concerts is typically 100dBA, and that levels below 95dBA will be unlikely to provide satisfactory entertainment for the audience.*

An electronic limiter is to be included within the PA design, which will be configured such that music noise levels produced by the PA system may not exceed a given level. While this level is yet to be defined as part of the final PA design, it shall be no more than **100dBA**, and this therefore represents a maximum.

As the level difference between inside and outside the venue is predicted to be in the region of **27dB**, as discussed above, it is predicted that, under typical pop concert usage, the level at 1m from the façade of the structure is likely to be in the region of **83dBA**. This is significantly below the noise limit at 1m from the venue, as shown in **Figure 4**.

Assuming a typical pop music spectrum, music played at around 100dBA is extremely unlikely to include the frequency content required to achieve **118dB** at either 63 Hz or 125 Hz.

As pop music events are discussed here as the “worst-case scenario”, it is therefore considered likely that under all real use cases, the temporary venue will not produce noise levels in excess of those recommended by the Code for Practice, when measured at the NSRs to the West.

### 4.3 Impact to NSRs to the North and South

As the minimum distance between the proposed location of the temporary venue and the nearest noise sensitive receivers to both the North and South is around **650m**, this implies a level difference of **64dB**.

In practice, the level difference will be significantly higher than this, as several structures within the Butlin’s site shall provide shielding the noise sensitive receivers, reducing the noise level significantly.

For these NSRs, the background level measured during the survey measurement is taken as representative. As noted above, decreased levels of traffic noise during the Coronavirus restrictions make it likely that this is a conservative estimate of typical noise levels in this location.

	63 Hz	125 Hz	A-w
<b>Measured Background Level</b>	-	-	44 dB L <sub>Aeq</sub>
<b>Limit at 1m from NSR</b>	70 dB L <sub>eq</sub>	70 dB L <sub>eq</sub>	49 dB L <sub>Aeq</sub>
<b>Limit at 1m from Venue</b>	126 dB L <sub>eq</sub>	126 dB L <sub>eq</sub>	105 dB L <sub>Aeq</sub>

Figure 5: The measured background noise and derived limits for Music Noise Level (MNL) to comply with The Code of Practice on Environmental Noise Control at Concerts for NSRs to the West. Note that the 63Hz and 125Hz octave band limits are not based on the background level.

As the L<sub>Aeq</sub> limit at 1m from the façade is higher in this case than that shown in **Figure 4**, above, it can be taken that if the limits shown for the NSRs to the West are met, the limits for the NSRs to the North and South will be met implicitly.



## 5.0 SUMMARY

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- A new temporary entertainment venue is proposed within the existing Butlin's Skegness site. The temporary venue shall operate only until 23.00hrs.
- The nature or character of noise produced by the site is not anticipated to change significantly as a result of the introduction of the temporary venue.
- MFLLP have measured existing noise levels on the site, during "lockdown" restrictions, so as to identify the background noise levels at the sensitive receiver that are representative of those experienced during the Coronavirus pandemic.
- The background noise levels as measured during "lockdown" are relevant to the proposed temporary venue as it is intended to be operated in the near future during the current Coronavirus pandemic and associated restrictions.
- These measurements were compared to a worst-case prediction of levels of music noise at the façade of the noise sensitive receiver.
- The levels of music noise in this worst-case scenario are such that they satisfy the broadband and low-frequency requirements of the accepted guidance document for music.
- Due to the electronic limiter, which is to be included within the PA design, levels produced by the PA system within the venue shall be no more than 100dBA.
- It is therefore judged that there is low likelihood of negative impact at the nearest residential receiver.

## 6.0 APPENDICES

### 6.1 Appendix A – Glossary of Acoustic Terms

#### **FREQUENCY, $f$ (Herz, Hz)**

The rate of vibration of the air molecules which transmit the sound measured in cycles per second or Hertz. The human ear is sensitive to sound in the range 20Hz – 20kHz.

#### **SOUND PRESSURE LEVEL (SPL), $L$ (dB)**

The sound level measured on a logarithmic scale, with unit decibel dB. This scale is linearly weighted, as opposed to A-weighted (see below). A free-field SPL refers to a level determined far enough from surfaces or facades, apart from the ground, so as not to be influenced by reflections from those surfaces.

#### **A-WEIGHTED SOUND PRESSURE LEVEL (SPL), $L_A$ (dBA)**

A-weighted SPL values (or noise levels) are weighted in a way that approximates the frequency response of the human ear and allows sound levels to be expressed as a single figure value.

#### **EQUIVALENT CONTINUOUS A-WEIGHTED SPL, $L_{Aeq,T}$ (dBA)**

Energy weighted average of the A-weighted sound pressure level over a time period,  $T$ . The level of a notional continuous sound that would deliver the same A-weighted sound energy as the actual fluctuating sound over the course of the defined time period,  $T$ .

#### **MAXIMUM A-WEIGHTED SPL, $L_{Amax}$ (dBA)**

The maximum A-weighted sound pressure level measured. If not specified, usually assumed to mean  $L_{AFmax}$ , i.e.  $L_{Amax}$  determined with a 'fast' (F) sound level meter time constant of 125ms.

#### **BACKGROUND NOISE, $L_{A90,T}$ (dBA)**

The value of the A-weighted sound pressure level that is exceeded for 90% of any given time interval,  $T$ . This value is generally adopted as representing the background noise level of a given environment. If not specified, usually assumed to mean  $L_{AF90,T}$ , i.e. determined with a 'fast' (F) sound level meter time constant of 125ms.

#### **RATING LEVEL, $L_{Ar,Tr}$ (dB)**

The rating level is the equivalent continuous A-weighted level for the same reference time period with adjustments applied to account for the tonal or impulsive nature of the sound source as described in BS7445-2.

### 6.2 Appendix B – Noise Survey Equipment Details

The equipment summarised in the table below has been calibrated by a UKAS accredited laboratory in accordance with the laboratory requirements of the United Kingdom Accreditation Service (UKAS) on the dates indicated.

Item	Make	Type	Serial no.	Calibration Intervals	Last Calibrated	Next Due Calibration	Calibration Certificate Number
Class 1 sound level meter	Norsonic	140	1404355	2 years	03/11/2020	02/11/2022	33210
Microphone	Norsonic	1225	33210	2 years	03/11/2020	02/11/2022	33210
Microphone preamplifier	Norsonic	1209	13637	2 years	03/11/2020	02/11/2022	33210
Calibrator	Norsonic	1251	30754	1 year	03/11/2020	02/11/2021	U34110