The King's Cross Theatre South Extension - Planning Application
Our Reference (D-SE-KX-011)

Sound Management Plan

Client

Theatre Tracks Limited
1st Floor, 62 Shaftesbury Avenue,
London, W1D 6LT

Development Management

Argent LLP
4 Stable Street
King's Cross
London N1C 4AB

Planning & Licensing Consultants

Entourage Live
Studio 3.12, Chester House
1 - 3 Brixton Road, Kennington
London, SW9 6DE

The Purpose of this Document

The purpose of this document is to describe the management process for the management and control of sound systems for the proposed theatrical performances at the King's Cross South Extension, to be held in a temporary structure on Zone A, Goods Way, King's Cross Central, London.

The document will also describe the monitoring scheme proposed to measure the levels of sound at residential premises and explain how these processes will jointly ensure the minimum disruption and impact that the show will have on local residential properties.

Definitions of the terms used can be found at the end of this document.

This statement forms part of the application for planning permission for these facilities.

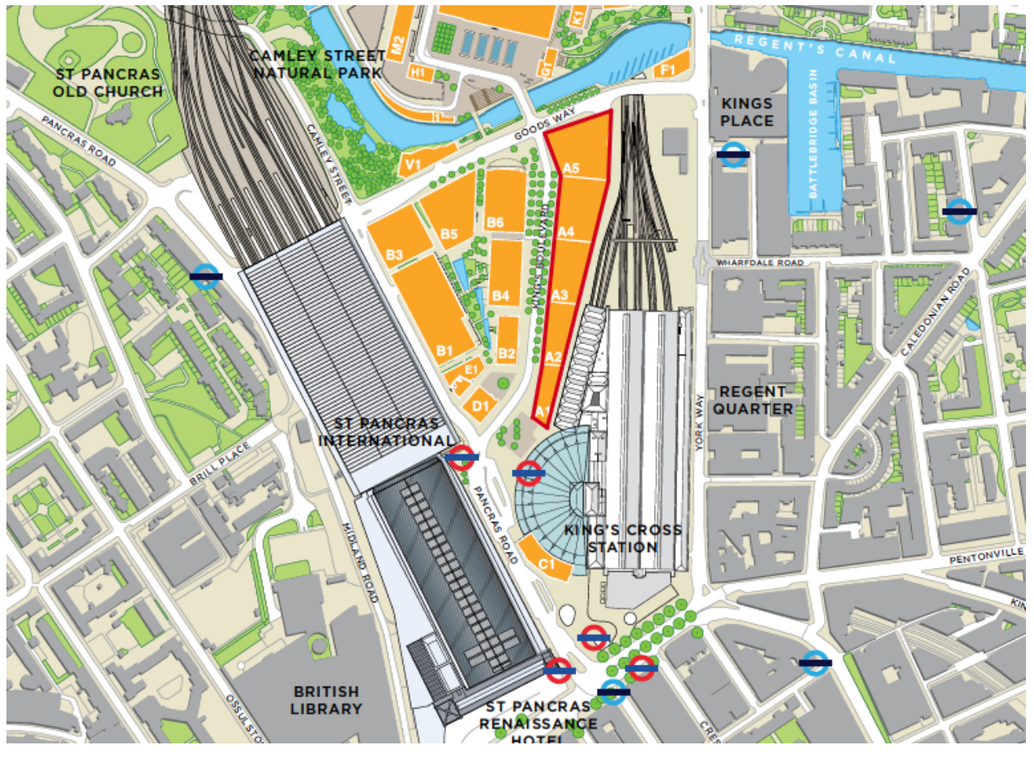
The Show

Both the Donmar venue (spoken performance) and the Lazarus venue (musical performance) contain theatrical performances. Both performances will take place in two separate temporary venues, which is to be known as The King's South Extension.

The Location

The proposed site for The King's Cross Theatre is an open area of land to the north of the King's Cross railway buildings, which will eventually be redeveloped as office accommodation. Currently the space is unused.

The area is a level, open space which is laid with a hard core/concrete surface. The site has been proposed following consultation with Argent LLP, the manager of the King's Cross Central scheme site. The site is bordered by the River Thames, The O_2 Building and AEG Worldwide office buildings.



It is accepted that there are considerations to be made for the use of the site, specifically regarding the location of the nearest residential neighbours.

The Structures

Both the Donmar and Lazarus auditoria are constructed from a large, clear span marquees, with no internal supporting roof beams, meaning that there are excellent sight lines from virtually all the seats. For an internal view of the floorplan please see drawing P-SE-KX-16-004.

The audio systems installed in both theatre venues are carefully designed to focus the speech replication and musical elements of the performance towards the audience to maintain the impact of the show and experience for the visitor. The sound design team can directly control the sound system to ensure that the majority of the sound is contained within the temporary structure and that sound 'bleed' is minimised.

In addition, the controllable and directional nature of the system means that it can be run at a much lower sound level than would otherwise be necessary.

The performance is contained within large marquee structures that uses fabric which will give an approximate attenuation of 10db. In addition the side wallings of the structures are constructred from a solid ABS plastic and internal acoustic linings will be used to dampen the sound that does spill outside of audience areas.

Noise Control Guidelines

Noise Guidance – Existing Residential

As with other licensed premises across London, and following consultation with the Local Authority, it has been decided that events at The King's Cross Theatre should follow the general guidance given in the Noise Council Code of Practice on Environmental Noise Control at Concerts. The Code gives guidance depending upon the number of concerts per year and for the most frequent category (30 times per year), it is recommended that music noise levels (LAeq 15 min) should not exceed the background LA90 by more than 5dB(A).

The performances are programmed to finish no later than 23:00 hours daily.

It is proposed that the event will operate on a daily basis for approximately 12months (dependent on ticket sales) which will generate show days exceeding 30 times in the year). As it is located in a temporary structure, it is considered that a more stringent guideline should be adopted.

The following targets will be adopted by the producers of the show:

- The noise from the shows should not be discernible inside residential properties.
- The external music LAeq should be 5dB below the existing LA90 background noise level.

These are very stringent criteria and often apply for events operating after 2300 hours. For after 2300 hours, it is recommended by the Local Authority that the music noise should not be discernible inside residential premises. This is in line with the recommendations of the Noise Council Code of Practice which recommends inaudibility inside residential properties after 2300 hours.

Noise Guidance – New Residential

For new residential properties, proposed close to The South Extension, advice should be followed as given in BS8233:1999. A scheme of sound insulation should be presented with the planning application to ensure that the required internal noise levels can be achieved within the new development with regard to music and ancillary noise associated with the King's Cross Central scheme.

Sound Management

A baseline noise monitoring protocol has been proposed by the show producers for the proposed King's Cross Theatre. For Meridian Gardens (a nearby and previously used event space), a residential location had been identified before the Afrika Afrika shows (and subsequently utilised for the Monkey: Journey to the West performances, as well as Peter Pan at The O_2) which comprises of high rise apartments directly opposite the site to the North of the river in the borough of Tower Hamlets.

This location is by Yabsley Street (location 1). As a result of a noise complaint during the Afrika Afrika shows, a further

location was identified at Coldharbour (location 2), also in the borough of Tower Hamlets.

Noise Management Mitigation

Previous experience of other shows in similar tented structures show that reduction in sound from the performances can be achieved through the use of directional loudspeaker equipment, with the tent structure providing 10dB attenuation.

Temporary portable buildings and sound attenuation facades and fabric insulation will be used to screen the sound sources (generators and HVAC systems) where possible. In addition sound screening will be incorporated around plant equipment if sound source issues are identified once the site is built and commissioned.

Theatre Tracks Limited will work in consultation with Greenwich Environmental Health Officers to ensure that the sound generated is not an issue for those living in the nearby locality.

Communications

Theatre Tracks Limited will write to the local residents in the local residential premises which are identified as being sensitive to the temporary venue. The letter text will be in a pre-agreed format and provide information of the show timings, telephone numbers that residents can use to contact the site management team in the event that they have an issue or question as well as details of who enquiries can be passed to at Theatre Tracks Limited and Camden Council (see document D-KX-16-017).

Monitoring

Prior to the first performance, sound propagation testing will be completed to set the music noise limit within the tent to meet the environmental noise limits at the community locations. This will be completed during the rehearsals period in the lead up to the opening night of the performance. Directional control of the sound system and fine tuning will also be carried out at this time in order to obtain the maximum sound level inside the tent whilst complying with external limits. This will be completed with both Argent LLP and Camden Council.

The first two shows will be monitored by the Theatre Tracks Limited technical production team to ensure that the external noise limits are being met.

Discussion will take place with the Environmental Health Department on the best form of action to be taken if complaints of noise arise from the venue. On request, the complaints log will be issued to the local authority. The log will include the time, nature and location of the complaint including the action that was taken.

Glossary of Terms

Definitions and Units

Noise is defined as unwanted sound. The range of audible sound is from 0dB to 140dB, which is taken to be the threshold of pain. The sound pressure detected by the human ear covers an extremely wide range. The decibel (dB) is used to condense this range into a manageable scale by taking the logarithm of the ratio of the sound pressure and a reference sound pressure.

The unit of frequency is Hz. 1 Hz is one pressure fluctuation in one second. The frequency response of the ear is usually taken to be about 16Hz (number of oscillations per second) to 18,000Hz. 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 subjective response to noise is the dB(A) weighting. This electronic filter matches the variation in the frequency sensitivity of the meter to that of the human ear. 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 3dB(A) difference between them. Also when two sound sources of the same noise level are combined the resultant level is 3dB(A) higher than the single source. When two sounds differ by 10dB(A) one is said to be twice as loud as the other.

Sound Level, dB(A) Environmental Condition

0 – 10	Threshold of hearing
10 - 20	Broadcasting Studio
20 – 30	Bedroom at night
30 – 40	Library
40 – 50	Living room urban area
50 – 60	Typical Business Offices
60 – 70	Conversation Speech
70 – 80	Average traffic on street corner
80 – 90	Inside bus
100 – 110	Alarm Clock (1m away)
110 – 120	Loud car horn (1m away)
120 – 130	Pneumatic drill (1m away)
130 - 140	Threshold of pain

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

LAeq: 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. It is in effect the energy average level over the specified measurement period (T) and is the most widely used indicator for environmental noise.

LAN: the A-weighted sound level exceeded for N% of the measurement period. In BS7445 the LA90 is used to define the background noise level, i.e. the noise that would remain once all local noise sources were removed. The LA10 gives an indication of the upper limit of fluctuating noise and is used in the assessment of road traffic noise.

Contacts and Further Information

Planning Application

Consultant:	**Entourage Live**
Contact:	Rob Haworth
Email:	rob.haworth@entouragelive.com
Mobile:	+44 (0) 7977 498170
Gloucester Office:	The Lancaster Centre, Meteor Business Park, Gloucester GL2 9QL
Tel:	+44 (0) 1452 347830
London Office:	Studio 3.12, Chester House, 1 - 3 Brixton Road, Kennington, London SW9 6DE
Tel:	+44 (0) 20 3137 6737
Website:	www.entouragelive.com

Applicant:	**Theatre Tracks Limited**
Company Number:	906891431
Address:	Registered Office – 1st Floor, 62 Shaftesbury Avenue, London, W1D 6LT