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Technical Note

Prepared by:	**Richard Lyons**	Date:	**18 April 2017**
Project:	**Rank Mecca Camden**	Ref:	**4674**
For:	**Gary Arnold (Rank)**	Page:	**1 of 7**
Subject:	**Environmental Noise – Mecca Camden**		

Introduction

Rank Group is proposing to refurbish the Mecca Bingo Hall at Arlington Road, Camden Town, London, NW1 7HL. As part of the refurbishment it is proposed that new mechanical plant will be installed at the site. This new plant is proposed to be located near to the existing plant withn the service yard accessed from Inverness Street.

WBM carried out a noise survey at the Mecca Bingo Hall during the night-time of Monday 10 April to Tuesday 11 April 2017. The survey consisted of sample 15 minute measurements undertaken at three locations representative of the nearest dwellings to the Mecca building proposed plant location.

This Technical Note sets out the findings of the noise survey work and suggests a noise limit at the closest dwellings to the new mechanical plant proposed at the site. To aid comprehension, a glossary of acoustic terms is presented in Appendix A.

Site Location

The Mecca Bingo Hall is located at Arlington Road, Camden Town, London, NW1 7HL. The closest dwellings to the bingo hall proposed plant location are flats located on the corner of Inverness Street and the entrance to the service yard, with some dwellings overlooking the service yard, and on the north side of Inverness Street above retail, bar/pub and restaurant units.

A plan of the site location, showing the closest dwellings, the sound level meter sample positions and the location of the existing operating plant is shown in Appendix B.

Survey Details

WBM carried out a night-time noise survey at the Mecca Bingo Hall between 01:00 hours and 03:10 hours on Tuesday 11 April 2017. Attended sample measurements of 15 minute duration were undertaken at three locations representative of the nearest noise sensitive properties (dwellings) in the vicinity of the Camden Mecca building and proposed new plant location, as shown on the marked plan in Appendix B.

Measurements were undertaken in free field locations with the microphone height at around 1.4m above local ground level and with a windshield used throughout. Details of the equipment used for the survey are presented in Appendix C.

Survey Results

A table of the survey results is presented in Appendix D together with observations of the ambient noise climate. The background noise level was affected mainly by local road traffic and activities on Camden High Street with existing plant operating at the Mecca Bingo in the service yard just audible in lulls.

A summary table of the background noise levels at each of the survey locations is presented below.

Location	Average Background Noise Levels dB $L_{A90,15\ min}$
A	49
B	47
C	46

Suggested Plant Noise Limit

WBM has held recent discussions with London Borough of Camden Environmental Health Officer, Ian Pendrigh, with regard to the noise criteria required by the council in this borough for new M&E plant. It was confirmed that the noise level from new plant should be 10 dB below the existing background noise level, with no distinctive acoustic features. It is considered that this requirement would therefore apply to the Mecca Camden.

Based upon the above criteria and the results of the baseline noise survey it is suggested that any new plant proposed at the site is designed to achieve the following limits:

i) At or below 37 dB $L_{A15\ min,\ freefield}$ at the closest dwellings at No 5 Inverness Street.

ii) At or below 36 dB $L_{A15\ min,\ freefield}$ at the dwellings above retail outlets on the north side of Inverness Street.

Note that in the design and specification of the proposed plant, account will also need to be taken of any possible distinguishable features may be evident at the closest dwellings. If the new plant contains any acoustic features (i.e. is tonal, and/or impulsive, and/or intermittent, or contains any other features) the design level will need to be reduced to take this into account.

Dr Richard Lyons
Partner

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Appendix A – Glossary of Acoustic Terms

General Noise and Acoustics

The following section describes some of the parameters that are used to quantify noise.

Decibels dB

Noise levels are measured in decibels. The decibel is the logarithmic ratio of the sound pressure to a reference pressure ($2x10^{-5}$ Pascals). The decibel scale gives a reasonable approximation to the human perception of relative loudness. In terms of human hearing, audible sounds range from the threshold of hearing (0 dB) to the threshold of pain (140 dB).

A-weighted Decibels dB(A)

The 'A'-weighting filter emulates human hearing response for low levels of sound. The filter network is incorporated electronically into sound level meters. Sound pressure levels measured using an 'A'-weighting filter have units of dB(A) which is a single figure value to represent the overall noise level for the entire frequency range.

A change of 3 dB(A) is the smallest change in noise level that is perceptible under normal listening conditions. A change of 10 dB(A) corresponds to a doubling or halving of loudness of the sound. The background noise level in a quiet bedroom may be around 20 –30 dB(A); normal speech conversation around 60 dB(A) at 1 m; noise from a very busy road around 70-80 dB(A) at 10m; the level near a pneumatic drill around 100 dB(A).

Façade Noise Level

Façade noise measurements are those undertaken near to reflective surfaces such as walls, usually at a distance of 1m from the surface. Façade noise levels at 1m from a reflective surface are normally around 3 dB greater than those obtained under freefield conditions.

Freefield Noise Level

Freefield noise measurements are those undertaken away from any reflective surfaces other than the ground

Frequency Hz

The frequency of a noise is the number of pressure variations per second, and relates to the "pitch" of the sound. Hertz (Hz) is the unit of frequency and is the same as cycles per second. Normal, healthy human hearing can detect sounds from around 20 Hz to 20 kHz.

Octave and Third-Octave Bands

Two frequencies are said to be an octave apart if the frequency of one is twice the frequency of the other. The octave bandwidth increases as the centre frequency increases. Each bandwidth is 70% of the band centre frequency.

Two frequencies are said to be a third-octave apart if the frequency of one is 1.26 times the other. The third octave bandwidth is 23% of the band centre frequency.

There are recognised octave band and third octave band centre frequencies. The octave or third-octave band sound pressure level is determined from the energy of the sound which falls within the boundaries of that particular octave of third octave band.

Appendix A (continued)

Maximum Sound Pressure Level L_{Amax}

The L_{Amax} value describes the overall maximum 'A'-weighted sound pressure level over the measurement interval. Maximum levels are measured with either a fast or slow time weighted, denoted as $L_{Amax,f}$ or $L_{Amax,s}$ respectively.

Noise Rating NR

The noise rating level is a single figure index obtained from an octave band analysis of a noise. The NR level is obtained by comparing the octave band sound pressure levels to a set of reference curves and the highest NR curve that is intersected by the sound pressure levels gives the NR level.

Sound Exposure Level L_{AE} or SEL

The sound exposure level is a notional level which contains the same acoustic energy in 1 second as a varying 'A'-weighted noise level over a given period of time. It is normally used to quantify short duration noise events such as aircraft flyover or train passes.

Statistical Parameters L_N

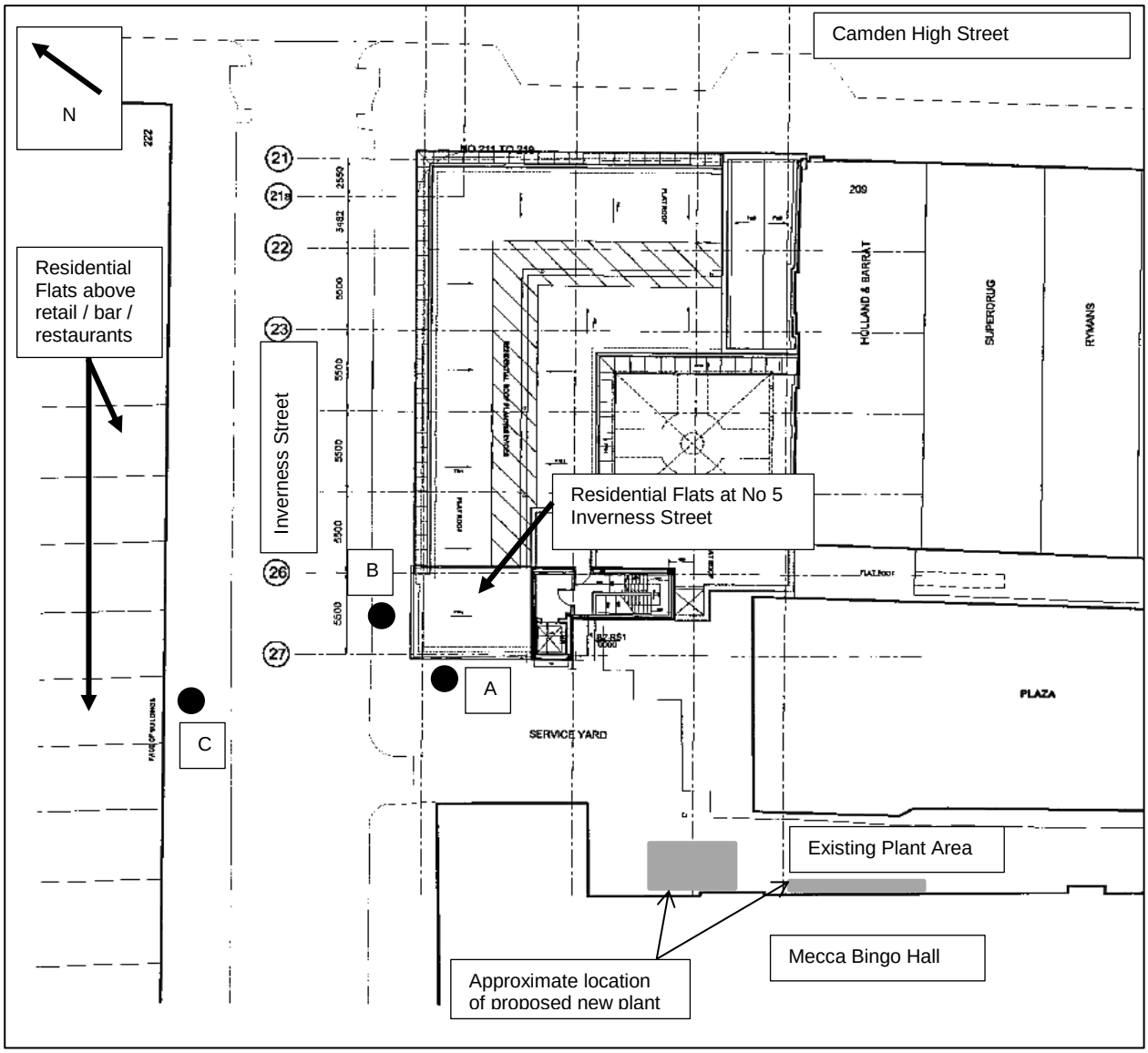
In order to cover the time variability aspects, noise can be analysed into various statistical parameters, i.e. the sound level which is exceeded for N% of the time. The most commonly used are the $L_{A01,T}$, $L_{A10,T}$ and the $L_{A90,T}$.

$L_{A01,T}$ is the 'A'-weighted level exceeded for 1% of the time interval T and is often used to gives an indication of the upper maximum level of a fluctuating noise signal.

$L_{A10,T}$ is the 'A'-weighted level exceeded for 10% of the time interval T and is often used to describe road traffic noise. It gives an indication of the upper level of a fluctuating noise signal. For high volumes of continuous traffic, the $L_{A10,T}$ unit is typically 2–3 dB(A) above the $L_{Aeq,T}$ value over the same period.

$L_{A90,T}$ is the 'A'-weighted level exceeded for 90% of the time interval T, and is often used to describe the underlying background noise level.

Appendix B – Site Layout Plan & Survey Locations



Location	Description
A	1 metre from open mesh fence to the Service Yard
B	3 metres from entrance door to No.5 Inverness Street flats
C	3 metres from railings of façade between retail outlets known as “Made in Brazil” and “Out on the Floor Records”

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Appendix C – Survey Details

Date and Locations of Survey

01:00 to 03:10 Tuesday 11 April 2017

Noise measurements locations as shown on the marked plan in Appendix B

Survey carried out by

Richard Lyons

Weather Conditions

Dry, cold, cloudy, north-westerly wind 1-3 m/s, 8-9°C

Instrumentation and Calibration

The instrumentation used (including serial number in brackets) is tabulated below. The sensitivity of the meter was verified on site immediately before and after the survey using the field calibrator. The measured calibration levels were as follows:

Instrumentation	Start Cal	End Cal
Norsonic 140 Sound Level Meter (1403137)	113.6 dB(A)	113.7 dB(A)
Norsonic 1251 Calibrator (31993)		

The meters and calibrators are tested monthly against a Brüel and Kjær Pistonphone, type 4220 (serial number 375806) and a Norsonic Calibrator, type 1253 (serial number 22906) with UKAS approved laboratory certificate of calibration. In addition, the meters and calibrators undergo traceable calibration at an external laboratory every two years.

Survey Details

Attended sample measurements of 15 minute duration were undertaken at locations representative of the nearest noise sensitive properties (dwellings) in the vicinity of the Camden Mecca building, as shown on the marked plan in Appendix B. The microphone was at a height of between 1.2 and 1.5 metres above local ground level, with a windshield used throughout.

Appendix D – Survey Results

Location	Start Time	Results dB (T = 15 minutes)			Comments / Observations
		$L_{Aeq,T}$	$L_{A10,T}$	$L_{A90,T}$	
A	01:00	52	55	48	Road traffic on local roads. Shutter noise at pub. Passers-by. Car music. Whistles and voices. Plant noise just audible when no road traffic. Aircraft movement. Activity on Camden High Street.
B	01:16	55	56	47	Road traffic on local roads. Night revelers on Camden High Street. Passers-by on phones. Occasional bang and singing on Camden High Street. Aircraft movement.
C	01:34	52	54	46	Voices on Camden High Street. Music just audible at nearby building. Road traffic on Camden High Street. Occasional road traffic on Arlington Road. Activity on Camden High Street and skateboarders.
B	01:50	52	55	47	Road traffic on Camden High Street. Occasional road traffic and car doors on Arlington Road. Voices, shouting and whistling from Camden High Street. Distant road traffic. Distant engine drone. Passers-by.
C	02:05	51	55	46	Road traffic, horns, laughter and voices from Camden High Street. Occasional road traffic on Arlington Road. Helicopter nearby.
B	02:21	53	57	47	Intermittent road traffic on Camden High Street and Arlington Road. Truck idling & reversing bleepers on Camden High Street. Distant road traffic. Activity at café on Camden High Street. Waste collection truck nearby.
A	02:38	54	56	49	Intermittent road traffic, laughter and shouts on Camden High Street. Slight hum from nearby plant. distant aircraft. Staff locking up at 'Made in Brazil'. Helicopter movements. Occasional road traffic on Arlington Road. Passers-by voices.
C	02:54	52	56	47	Helicopter movements. Occasional road traffic on Arlington Road. Intermittent road traffic, passers-by & voices on Camden High Street. Distant siren. Shouting from Arlington Road. Delivery trolley noise on Camden High Street.