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Kings Cross Taxi Club

Camley Street London

Noise Assessment

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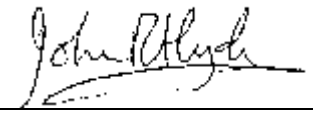
Signature			
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1. INTRODUCTION

At the request of Gavin Tresidder and as instructed by Jonathan Phillips of Meeson Williams Phillips Ltd, an assessment of noise impact has been carried out at The Kings Cross Taxi Club, Camley Street. It is understood that concern about noise from taxis using the site have been made by occupiers of neighbouring properties. The Club is a modular building in the eastern corner of the Booker car park at approximately 85m from the nearest dwellings The assessment has been carried out according to current planning policy on noise.

Noise measurements were carried out in March 2014, however, at the request of the Environmental Health Officer of London Borough of Camden, further measurements were carried out on 1st September 2014 covering the night time period 2300-0700.

The measurements and assessment have been carried out by John Hyde, a Chartered Physicist and Member of the Institute of Acoustics who has over 30 years experience as a noise and acoustics consultant and has lectured on acoustics at North East London College.

2. TERMINOLOGY

It is current practice to measure sound levels in decibels (dB). The decibel scale is logarithmic rather than linear. It is helpful to remember that a noise level change of 3dB on a sound meter reading would be just perceptible, and that an increase of 10 dB is perceived, subjectively, as a doubling of loudness. The human ear responds differently to sounds of different frequencies. The ear "hears" high frequency sound of a given level more loudly than low frequency sound of the same level. The A-weighted sound level, dB(A), takes this response into consideration and is commonly used for measurement of environmental noise in UK. It indicates the subjective human response to sound.

Environmental noise levels vary continuously from second to second. It is clearly impractical to specify the sound level for each second thus time averaging is required. In practice human response has been related to various units which include allowance for the fluctuating nature of sound with time. For the purpose of this report these include:

$L_{Aeq,T}$: the equivalent A-weighted continuous sound level over period T.
This unit relates to the equivalent level of continuous sound for a specific time period T, for example 16 hr for daytime noise. It contains all the sound energy of the varying sound levels over the same time period, and expresses it as a continuous sound level over that period. The unit is used for assessing traffic, transportation and industrial noise for planning purposes.

$L_{A90,T}$: the A-weighted level of sound exceeded for 90% of the time period T.
This latter unit is commonly used to represent the background noise, and is used in

assessing the effects of industrial noise in UK.

L_{Amax} : the maximum A-weighted sound level over a period of measurement

3 NOISE CRITERIA

Planning Policy

The 'National Planning Policy Framework' (NPPF) (2012) gives three planning policy and decision aims in respect of noise:

- *Avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development*
- *Mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including the use of conditions, while recognising that many developments will create some noise; and*
- *Identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason*

As part of the framework, the 'Noise Policy Statement for England' (NPSE) (2010) reinforces the three policy aims on noise as follows:

- *Avoid significant adverse impacts on health and quality of life*
- *Mitigate and minimise adverse impacts on health and quality of life*
- *Where possible, contribute to the improvement of health and quality of life*

It is possible to apply objective standards to the assessment of noise which uphold these policy aims. The effect of introducing a certain noise source may be determined by several methods, as follows:

- The effect may be determined by reference to guideline noise values. BS8233:1999 'Sound insulation and noise reduction for buildings – A code of practice' and WHO 'Guidelines for Community Noise' contain such guidelines
- The effect may be determined by considering the change in noise level that would result from a proposal in an appropriate noise index for the characteristic of the noise in question.
- Another method is to compare the resultant noise level against the background noise level of the area, as used in BS4142:1997 to determine the likelihood of complaints from noise of an industrial nature

4 NOISE MEASUREMENTS

The first set of noise measurements was carried out at the site on 17th March 2014. Weather conditions were dry and cloudy with no wind. The noise measurement position is shown in Figure1, at a distance of 10m from the kerbside of Camley Street in the Booker car park and opposite Crofters Way. The purpose of the measurements

was to determine the impact of noise from taxis entering and leaving the car park relative to noise from other traffic on Camley Street. Noise from the air conditioning unit at the Club building was also measured.

The noise measurements were carried out using a SVAN 955 Type I integrating sound level meter, serial no. 27330 which was calibrated before and after the measurement and no drifting of the calibration signal was observed. Measurements were undertaken for 15 minute periods according to the procedures recommended in BS7445:2003 'Description and measurement of environmental noise – Part1' and the following parameters were recorded:

L_{Aeq} The equivalent continuous noise level
L_{Amax} The maximum noise level during each measurement
L_{A90} The level exceeded for 90% of the time, the background level

Staff involved with noise measurements were fully competent, either being Members of the Institute of Acoustics or holding a Certificate of Competence in Environmental Noise Measurement.

The results of the noise measurements are shown in Table 1. During each 15 minute period the type of vehicle giving rise to the L_{Amax} level was noted

Table 1: Results of traffic noise measurements on Camley Street

Time	LAeq	LAmax	LA90	Comments on source of LAmax levels
	dB	dB	dB	
2200	57.2	75.8	42.6	HGV
2215	52.6	68.1	42.8	Van
2230	51.5	72.0	42.7	HGV
2245	53.8	74.3	41.0	HGV
2300	53.2	67.9	42.3	Van
2315	50.5	64.9	42.5	Taxis
2330	50.5	65.8	41.2	Taxis
2345	55.3	70.5	40.4	HGV
0000	47.8	65.7	39.7	Taxis
0015	49.6	65.9	40.5	Taxis
0030	53.4	69.7	40.9	Van
0045	50.3	62.5	44.5	Taxis
0100	53.5	72.9	45.2	HGV
0115	53.4	68.4	39.0	Van
0130	53.0	71.3	41.1	HGV
0145	49.4	65.5	41.0	Taxis
0200	47.0	63.4	40.5	Taxis
0215	52.1	69.5	40.1	Van
0230	52.5	74.7	38.7	HGV

Time	LAeq	LAmax	LA90	Comments on source of LAmax levels
	dB	dB	dB	
0245	50.4	62.6	39.5	Taxis
0300	51.9	69.8	40.2	Van
0315	49.7	63.0	38.3	Taxis

Noise levels of the air conditioning units were measured on the east and west side of the building at 1m from the façade giving the following results:

	$L_{Aeq,5min}$	L_{Amax}	L_{A90}
East side	58.7dB	60.1dB	57.3dB
West side	57.5dB	59.6dB	56.2dB

The second set of measurements was carried out on 1st September 2014 at the same location following the same procedure. Weather conditions were dry and mild with no wind. The noise measurements were carried out using a SVAN 955 Type I integrating sound level meter, serial no. 27330 which was calibrated before and after the measurement and no drifting of the calibration signal was observed. The following parameters were recorded:

L_{Aeq} The equivalent continuous noise level
L_{Amax} The maximum noise level during each measurement
L_{A90} The level exceeded for 90% of the time, the background level

The results of the noise measurements are shown in Table 2. During each 15 minute period the traffic flow on Camley Street was recorded, showing the number of taxis, cars, vans and HGV's.

Table 2: Results of traffic noise measurements and traffic flows on Camley Street

Time	LAeq	LAmax	LA90	Taxis	Cars	Vans	HGV
	dB	dB	dB				
2305	57.9	78.8	39.7	3	10	4	1
2320	56.7	79.3	40.8	5	8	2	1
2335	52.6	68.4	40.2	6	3	2	0
2350	53.0	72.5	39.9	4	7	1	1
0005	52.1	70.3	39.6	2	5	1	1
0020	50.8	71.4	40.5	3	3	2	1
0035	49.1	66.2	39.6	0	5	1	0
0050	52.4	72.3	41.0	4	7	0	1
0105	50.5	68.1	39.8	5	4	1	0
0120	51.5	62.3	38.8	3	0	0	0

Time	LAeq	LAmax	LA90	Taxis	Cars	Vans	HGV
	dB	dB	dB				
0135	52.9	72.3	39.3	2	5	1	2
0150	50.7	64.6	39.8	6	1	0	0
0205	53.6	76.6	38.2	2	8	2	2
0220	52.4	63.3	38.5	3	1	0	0
0235	55.6	74.3	43.2	0	7	1	1
0250	46.2	58.7	37.9	0	0	0	0
0305	55.9	75.1	39.8	2	6	0	1
0320	50.4	64.9	38.2	4	0	0	0
0335	48.6	66.9	38.0	2	1	0	0
0350	51.4	72.1	39.5	0	3	1	1
0405	45.8	61.8	38.1	1	0	0	0
0420	53.0	70.2	37.6	3	5	2	1
0435	56.3	78.4	37.9	2	4	0	2
0450	52.4	64.7	38.0	5	1	0	0
0505	50.6	72.6	38.6	0	7	1	1
0520	51.3	65.1	40.1	3	1	0	0
0535	50.3	69.4	39.3	2	6	2	0
0550	53.9	71.5	40.5	0	5	0	1
0605	50.7	64.6	39.7	2	4	0	0
0620	55.6	73.4	40.6	4	7	2	0
0635	51.9	68.9	41.0	0	5	1	0
0650	56.9	76.8	40.7	3	8	1	2
0705	57.4	69.0	40.9	4	10	2	0

This showed a total of 86 taxis during the night time period, with 147 cars, 30 vans and 20 HGV's.

Noise measurements were also undertaken for a short period on Weavers Way, approximately 100m to the north east of the entrance to the Booker car park as it is understood that concerns about taxi movements have been raised at this location. Measurements were taken using a Norsonic 118 sound level analyser serial no. 31501 which was calibrated before and after the measurement and no drifting of the calibration signal was observed. The results were as follows:

Time	LAeq	LAmax	LA90
	dB	dB	dB
2330	46.7	59.1	38.5
0240	45.6	58.9	37.1
0450	48.5	60.1	38.3

5 ASSESSMENT

Air Conditioning Plant

The air conditioning plant was located at 85m from the nearest dwellings. The noise from the plant would result in a level of 20dB at the nearest dwelling, ignoring any screening effects of the Booker building. This is clearly below the background noise at the dwellings and would not be audible.

Noise from Taxis

Planning Policy suggests that guidelines such as BS8233:2014 can be used to assess the significance of adverse noise impacts. The criteria of this standard recommend that for the night time period, the $L_{Aeq,8hr}$ should not exceed 30dB in bedrooms. The former 1999 version of BS8233 also recommended that the L_{Amax} due to individual events should not exceed 45dB, however, this has been removed from the 2014 version.

Moise measurements were taken at 10m from the kerbside on the eastern side of Camley Street which is 3m less the distance of the nearest dwellings on the western side of Camley Street near Crofters Way. The dwellings appeared to be modern and double glazed. This form of glazing, when closed, offers a basic sound reduction of 25dB according to data supplied by Pilkington Glass. However, when the trickle ventilators of this type of window are open, the sound attenuation is reduced to 20dB. When taking account of the area of glass relative to the wall, (approximately 33%) the composite sound reduction of the façade would improve from 20 to 25dB

The overall free-field noise level was 52.4dB(A) over 5.5 hours during the March 2014 measurements and 53.2dB(A) in September 2014 over 8 hours, showing a difference of 0.8dB in average levels and very good agreement with the March 2014 data.. Taking the higher figure, the façade noise level would be 54.6dB (a 2.5dB increase for façade correction and a 1.1dB reduction for distance correction, according to the methodology of the DoT publication 'Calculation of Road Traffic Noise'). After allowing for the façade reduction, this would result in an internal noise level of marginally under 30dB, the criterion recommended by BS8233.

This suggests that the current night time noise falls within the acceptable standards of BS8233 at dwellings which use typical standard trickle ventilators. If windows are opened then levels would clearly be higher but that would be the choice of the occupier.

During the September measurements there were seven 15 minute periods when the only noise significant noise source was taxis. The L_{Aeq} of each period was used to calculate the SEL (single event noise level) of taxis within the period, as shown in

Table 3.

Table 3: SEL's of taxis during measurement periods when taxis were the most significant noise source.

Time	LAeq,15min	No. of Taxis	SEL of Taxis
	dB		
0120	51.5	3	76.3
0150	50.7	6	72.5
0220	52.4	3	77.2
0320	50.4	4	73.9
0405	48.5	2	75.3
0450	52.4	5	75.0
0520	51.3	3	76.1

The average SEL was 75.1dB(A), thus the night time $L_{Aeq,8hr}$ for 86 taxis would be 49.7dB.

Therefore, if the taxis were to be removed from the overall traffic flow then the L_{Aeq} noise level at the measurement position of 53.2 dB would fall to 50.6dB, a reduction of 2.6dB. This would be described as an imperceptible difference. However, L_{Amax} levels are more likely to disturb sleep than the average noise level. The L_{Amax} from the measured traffic flow was up to 79dB during the passing of HGV's through Camley Street, some of which entered and left the site with deliveries for Bookers. There were a total of 30 HGV movements during the 8 hour night time period. Using the same noise reduction methods as above, the internal L_{Amax} would be up to 55dB, this is clearly above the BS8233 1999 criterion of 45dB and would remain the same if the taxis were removed from the traffic flow.

The L_{Amax} values due to taxis were up to 66dB during the periods when only taxis were passing. Again, using the same noise reduction method, this would result in an internal L_{Amax} level of 42.7dB which is less than the criterion of 45dB.

Weavers Way

The noise levels measured on Weavers Way were due to distant traffic and some railway noise, HGV's on Camley Street were audible but taxis were not distinctly perceptible. The levels would result in internal noise levels well within the guidelines of BS8233.

6 CONCLUSIONS

It is concluded that noise from all current traffic including taxis, on Camley Street, at the junction with Crofters Way, would meet the internal noise guidelines at night of BS8233:2014 at the nearest dwellings.

However, peak noise levels from general traffic on Camley Street are likely to exceed the guidelines for internal noise levels at the nearest dwellings by up to 10dB at night, according to the 1999 version of BS8233.

Peak noise levels due to taxis would be lower than the level recommended by BS8233. If taxis were removed from the flow of traffic on Camley Street, the average L_{Aeq} noise level would reduce by an imperceptible 2.6dB. This would have no effect on the peak L_{Amax} levels due to HGV's and vans. Consequently the movement of taxis entering and leaving the Kings Cross Taxi Club is not the main cause of noise impact as significantly higher peak noise levels are generated by other traffic.

The conclusions following the September 2014 measurements were identical to those of the March 2014 measurements.

It is also concluded that noise from air conditioning plant at the Club would be inaudible at the nearest dwellings.

Figure 1: Noise Measurement Position