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SCORPION SHOES, 269 CAMDEN HIGH STREET, LONDON

NOISE IMPACT ASSESSMENT

Report 4001.NIA.01

Prepared on 18 May 2010

For:

Scorpion Shoes

269 Camden High Street

Camden

London

NW1 7BX

Minimum measured background levels are shown in Table 3.1.

	Minimum Background Noise $L_{A90:\ 15min}$ dB(A)
Daytime (07:00-23:00)	46
Night-time (23:00-07:00)	44
Proposed Operating Hours (08:00-18:00)	47

Table 3.1: Minimum background noise levels

4.0 NOISE CRITERIA

The London Borough of Camden's criteria for noise emissions of new plant installations are as follows:

> *"Design measures should be taken to ensure that specific plant noise levels at a point 1 metre external to sensitive façades are at least 5dB(A) less than the existing background measurement (L_{A90}) when the equipment is in operation. Where it is anticipated that equipment will have a noise that has distinguishable, discrete continuous note[...], special attention should be given to reducing the noise at any sensitive façade by at least 10dB(A) below the L_{A90} level."*

In order to provide a more robust assessment, it is proposed that criteria are set at 10dB below the exiting minimum background noise levels, as shown in Table 4.1.

	Daytime	Night-time	Operating Hours
Noise criterion at nearest residential receiver (10dB below minimum L_{A90})	36 dB(A)	34 dB(A)	37 dB(A)

Table 4.1: Proposed Noise Emissions Criteria

As the units are only expected to be used during normal shop opening hours, the operating hours criterion of 37dB(A) will be used in this assessment.

5.0 DISCUSSION

The proposed plant to be installed comprises four air conditioning units, selected as follows:

- 2 no. Hitachi Air Conditioning Unit type RAS-4HVRNE
- 2 no. Daikin Air Conditioning Unit type RZQ100D7V1B

The selected units each have a manufacturer's sound pressure level at 1m or sound power level as shown in Table 5.1. In each case, loudest modes of operation have been used, as they provide a worst case scenario.

	Sound Pressure Level at 1m / Sound Power Level (dB) in each Frequency Band								
Unit	**63Hz**	**125Hz**	**250Hz**	**500Hz**	**1kHz**	**2kHz**	**4kHz**	**8kHz**	**dB(A)**
Hitachi Unit type RAS-4HVRNE [1]	49	51	47	45	48	44	35	35	51
Daikin Unit type RZQ100D7V1B [2]	65	65	66	65	59	56	50	44	66

Table 5.1 Manufacturer spectral sound pressure/power levels for proposed units

[1] Manufacturer's sound pressure level at 1m

[2] Manufacturer's sound power level

The proposed units will be installed on a flat roof, above 269 Camden High Street. The closest residential window is approximately 8m from the proposed plant location.

As part of the proposals, a first floor extension will also be built onto the existing flat roof, for use as storage for Scorpion Shoes. We would recommend installing air conditioning units behind the proposed extension, such that the line of site to nearby residential windows is blocked, as shown in indicative site plan 4001.SP1.

Taking into account all necessary acoustic corrections including distance corrections and screening from the proposed extension, the resulting noise level at the window of the nearest noise sensitive receiver would be as shown in Table 5.2. Detailed calculations are shown in Appendix B.

Receiver	Operating Hours Criterion	Level at Receiver (due to proposed plant)
Nearest Residential Window	37 dB(A)	32 dB(A)

Table 5.2: Noise levels and criteria at nearest noise sensitive receivers

As shown in Appendix B, the predicted plant noise emissions would be expected to meet the requirements set out by the London Borough of Camden, provided units are installed with the line of sight to the nearest residential receivers blocked by the proposed first floor extension.

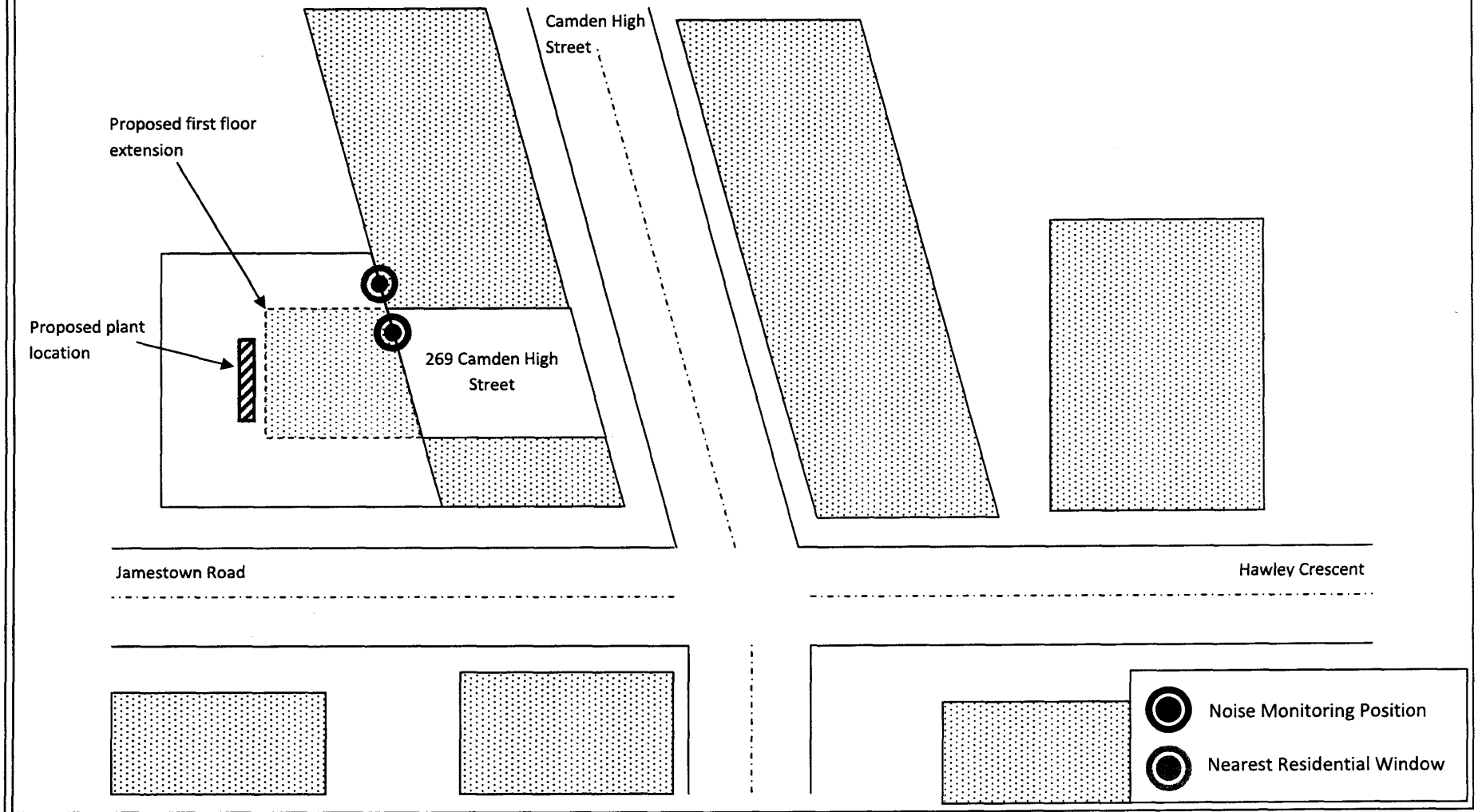
6.0 CONCLUSION

An environmental noise survey has been undertaken at Scorpion Shoes, 269 Camden High Street, Camden, London NW1 7BX. The results of the survey have enabled criteria to be set for noise

emissions from the proposed plant in accordance with the London Borough of Camden's planning conditions.

A noise impact assessment has then been undertaken using manufacturer noise data to predict noise levels at the nearby noise sensitive receivers due to the current proposals.

Calculations have shown that with by making use of a proposed first floor extension for screening, the noise emissions of the proposed installation will be within the requirements of the London Borough of Camden for the nearest noise sensitive receivers.



Title:
Indicative site plan showing noise monitoring position and nearest noise sensitive receiver

Date: 18 May 2010

FIGURE 4001.SP1

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269 CAMDEN HIGH ROAD, LONDON

Environmental Noise Time History
12 May to 13 May 2010

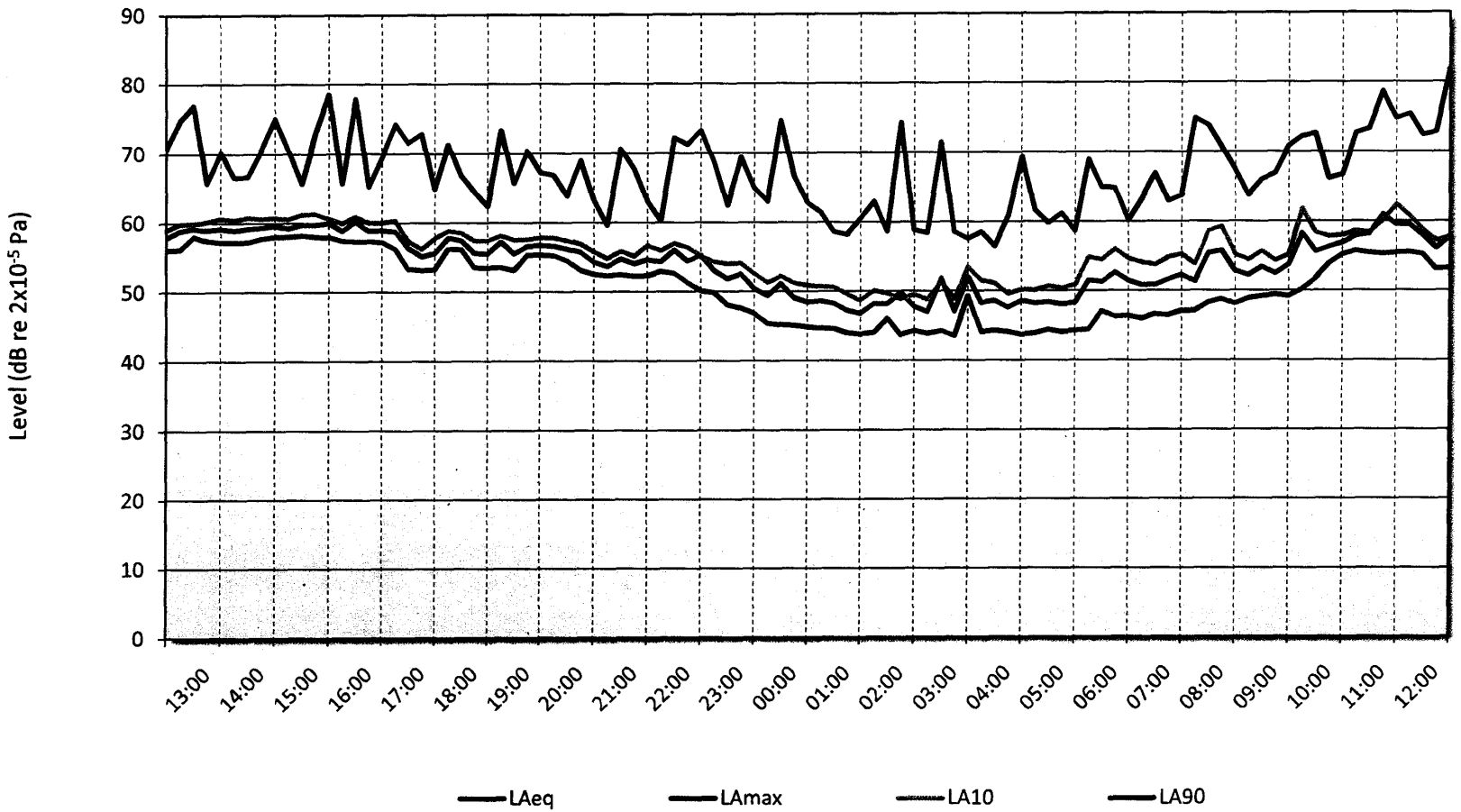

Figure 4001.TH1

APPENDIX A

GLOSSARY OF ACOUSTIC TERMINOLOGY

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dB(A)

The human ear is less sensitive to low (below 125Hz) and high (above 16kHz) frequency sounds. A sound level meter duplicates the ear's variable sensitivity to sound of different frequencies. This is achieved by building a filter into the instrument with a similar frequency response to that of the ear. This is called an A-weighting filter. Measurements of sound made with this filter are called A-weighted sound level measurements and the unit is dB(A).

L_{eq}

The sound from noise sources often fluctuates widely during a given period of time. An average value can be measured, the equivalent sound pressure level L_{eq}. The L_{eq} is the equivalent sound level which would deliver the same sound energy as the actual fluctuating sound measured in the same time period.

L_{10}

This is the level exceeded for not more than 10% of the time. This parameter is often used as a "not to exceed" criterion for noise

L_{90}

This is the level exceeded for not more than 90% of the time. This parameter is often used as a descriptor of "background noise" for environmental impact studies.

L_{max}

This is the maximum sound pressure level that has been measured over a period.

Octave Bands

In order to completely determine the composition of a sound it is necessary to determine the sound level at each frequency individually. Usually, values are stated in octave bands. The audible frequency region is divided into 10 such octave bands whose centre frequencies are defined in accordance with international standards.

Addition of noise from several sources

Noise from different sound sources combines to produce a sound level higher than that from any individual source. Two equally intense sound sources operating together produce a sound level which is 3dB higher than one alone and 10 sources produce a 10dB higher sound level.

Attenuation by distance

Sound which propagates from a point source in free air attenuates by 6dB for each doubling of distance from the noise source. Sound energy from line sources (e.g. stream of cars) drops off by 3dB for each doubling of distance.

Subjective impression of noise

Sound intensity is not perceived directly at the ear; rather it is transferred by the complex hearing mechanism to the brain where acoustic sensations can be interpreted as loudness. This makes hearing perception highly individualised. Sensitivity to noise also depends on frequency content, time of occurrence, duration of sound and psychological factors such as emotion and expectations. The following table is a reasonable guide to help explain increases or decreases in sound levels for many acoustic scenarios.

Change in sound level (dB)	Change in perceived loudness
1	Imperceptible
3	Just barely perceptible
6	Clearly noticeable
10	About twice as loud
20	About 4 times as loud

Barriers

Outdoor barriers can be used to reduce environmental noises, such as traffic noise. The effectiveness of barriers is dependent on factors such as its distance from the noise source and the receiver, its height and its construction.

Reverberation control

When sound falls on the surfaces of a room, part of its energy is absorbed and part is reflected back into the room. The amount of reflected sound defines the reverberation of a room, a characteristic that is critical for spaces of different uses as it can affect the quality of audio signals such as speech or music. Excess reverberation in a room can be controlled by the effective use of sound-absorbing treatment on the surfaces, such as fibrous ceiling boards, curtains and carpets.

APPENDIX B

SCORPION SHOES, 269 CAMDEN HIGH STREET, LONDON

EXTERNAL PLANT NOISE EMISSIONS CALCULATION

Receiver: Nearest Residential Window
Source: Proposed Plant Installation

	Frequency, Hz								
	63	***125***	***250***	***500***	***1k***	***2k***	***4k***	***8k***	***dB(A)***
Hitachi Air Conditioning Unit type RAS-4HVRNE									
Manufacturer's Sound Pressure Level at 1m	49	51	47	45	48	44	35	35	51
Correction for number of units (2)	3	3	3	3	3	3	3	3	
Cumulative Sound Power Level of Hitachi Units	52	54	50	48	51	47	38	38	54
Daikin Air Conditioning Unit type RZQ100D7V1B									
Manufacturer's Sound Power Level	65	65	66	65	59	56	50	44	66
Conversion to sound pressure level at 1m	-8	-8	-8	-8	-8	-8	-8	-8	
Correction for number of units (2)	3	3	3	3	3	3	3	3	
Cumulative Sound Pressure Level of Daikin Units	60	60	61	60	54	51	45	39	61
Cumulative Sound Pressure Level of All Units	61	61	61	60	56	53	46	42	62
Distance correction, dB 8m	-18	-18	-18	-18	-18	-18	-18	-18	
Attenuation from screening of proposed first floor extension, dB	-4	-7	-10	-11	-12	-12	-12	-12	
Sound pressure level at nearest residential window due to all units	39	36	33	31	26	23	16	12	32

Design Criterion	**37**