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8 December 2006

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Dear Philip

**RE: THE DIAMOND TRADING COMPANY
ENVIRONMENTAL NOISE SURVEY**

Please find enclosed our Environmental Noise Survey and Plant Noise Assessment Report 13539/ENS1 pertaining to the above project.

We trust you find the enclosed to be clear and of assistance, however, should you have any queries please do not hesitate to contact us.

Yours sincerely
for HANN TUCKER ASSOCIATES

David Fernleigh

cc: Martin Goswell - m.goswell@tbanda.com

Enc.

The Diamond Trading Company 17 Charterhouse Street, London

ENVIRONMENTAL NOISE SURVEY AND PLANT NOISE ASSESSMENT REPORT 13539 /ENS1

For :

The Diamond Trading Company
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11 December 2006

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REPORT 13539 /ENS1

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1.0 INTRODUCTION

As part of a refurbishment at The Diamond Trading Company, 17 Charterhouse Street, new items of building services plant are to be installed at 6th floor roof level. Hann Tucker Associates have therefore been commissioned to undertake a 24 hour environmental noise survey and propose plant noise emission criteria in accordance with Local Authority requirements.

This report presents the survey methodology and findings. The survey data has subsequently been used to assess the acceptability of the proposed new plant.

2.0 OBJECTIVES

To establish, by means of detailed 24 hour daytime and night time fully automated environmental noise monitoring, the existing A-weighted (dBA) L_{10} , L_{90} , L_{eq} and L_{max} environmental noise levels at selected accessible roof level positions around the site.

Based on the results of the noise survey, and in conjunction with the Local Authority, to recommend suitable plant noise emission criteria.

Based on the results of the noise survey data, to carry out a plant noise assessment of the proposed plant with regard to meeting the Local Authority requirements.

3.0 SITE DESCRIPTION

The site consists of two 6th floor flat roof areas at 17 Charterhouse Street. The site is bounded by Charterhouse Street to the South, Ely Place to the West and Saffron Hill to the East. To the North is the rear of buildings facing on to the streets named above.

4.0 ACOUSTIC TERMINOLOGY

The acoustic terms used in this report are as follows:

dB : Decibel - Used as a measurement of sound pressure level. It is the logarithmic ratio of the noise being assessed to a standard reference level.

dB(A) : The human ear is more susceptible to mid-frequency noise than the high and low frequencies. To take account of this when measuring noise, the 'A' weighting scale is used so that the measured noise corresponds roughly to the overall level of noise that is discerned by the average human. It is also possible to calculate the 'A' weighted noise level by applying certain corrections to an un-weighted spectrum. The measured or calculated 'A' weighted noise level is known as the dB(A) level.

Because of being a logarithmic scale noise levels in dB(A) do not have a linear relationship to each other. For similar noises, a change in noise level of 10dB(A) represents a doubling or halving of subjective loudness. A change of 3dB(A) is just perceptible.

L_{10} & L_{90} : If a non-steady noise is to be described it is necessary to know both its level and the degree of fluctuation. The L_n indices are used for this purpose, and the term refers to the level exceeded for $n\%$ of the time, hence L_{10} is the level exceeded for 10% of the time and as such can be regarded as the 'average maximum level'. Similarly, L_{90} is the average minimum level and is often used to describe the background noise.

It is common practice to use the L_{10} index to describe traffic noise, as being a high average, it takes into account the increased annoyance that results from the non-steady nature of traffic noise.

L_{eq} : The concept of L_{eq} (equivalent continuous sound level) has up to recently been primarily used in assessing noise in industry but seems now to be finding use in defining many other types of noise, such as aircraft noise, environmental noise and construction noise.

L_{eq} is defined as a notional steady sound level which, over a stated period of time, would contain the same amount of acoustical energy as the actual, fluctuating sound measured over that period (e.g. 1 hour).

The use of digital technology in sound level meters now makes the measurement of L_{eq} very straightforward.

L_{max} : L_{max} is the maximum sound pressure level recorded over the period stated. L_{max} is sometimes used in assessing environmental noise where occasional loud noises occur, which may have little effect on the L_{eq} noise level.

5.0 METHODOLOGY

5.1 Procedure

Fully automated environmental noise monitoring was undertaken from approximately 13:00 hours on Wednesday 6 December 2006 to approximately 13:00 hours on Thursday 7 December 2006.

Due to the nature of the survey, i.e. unmanned, it is not possible to accurately comment on the weather conditions throughout the entire survey period. However at the beginning and end of the survey period the wind conditions were breezy from approximately a Westerly direction. The sky was generally clear. We understand that generally throughout the survey period the weather conditions were mixed.

These conditions are considered suitable for obtaining representative measurement results.

Measurements were taken continuously of the A-weighted (dBA) L_{10} , L_{90} , L_{eq} and L_{max} sound pressure levels over 15 minute periods.

5.2 Measurement Positions

The noise level measurements were undertaken at 2 positions around the development site. Position Nos 1 and 2 were selected in order to assess the lowest noise levels at the development site for subsequent use in setting plant noise emission criteria. The measurement positions are described below, and their approximate locations are indicated on the enclosed Site Plan 13539 /SP1.

Position No	Description
1	The Sound Level Meter was located at 6 th floor roof level on the Southern side of the building fronting onto Charterhouse Street. The Microphone was fixed to a pole and attached to a railing approximately 2 metres from the flat roof.
2	The Sound Level Meter was located at 6 th floor roof level on the Northern side of the building facing the rear of buildings on Charterhouse Street, Ely Place and Saffron Hill. The Microphone was fixed to a pole and attached to a railing approximately 2 metres from the flat roof.

5.3 Instrumentation

The instrumentation used during the survey is presented in the Table below:

Description	Manufacturer	Type	Serial Number	Latest Verification
Type 1 Data Logging Sound Level Meter	Larson Davis	820	0975	LD calibration on 22/09/2006
Type 1 Data Logging Sound Level Meter	Larson Davis	820	0978	LD calibration on 22/09/2006
Type 1 ½" Condenser Microphone	Larson Davis	2541	4839	LD calibration on 22/09/2006
Type 1 ½" Condenser Microphone	Larson Davis	2541	4878	LD calibration on 22/09/2006
Type 1 Calibrator	Larson Davis	CAL200	3082	LD calibration on 23/10/2006

Each sound level meter, including the extension cable, was calibrated prior to and on completion of the surveys. No significant changes were found to have occurred (no more than 0.5 dB).

Each sound level meter was located in an environmental case with the microphone connected to the sound level meter via an extension cable. Each microphone was fitted with a Larson Davis windshield.

6.0 RESULTS

The results have been plotted on Time History Graphs 13539/TH1 to 13539/TH4 enclosed presenting the 15 minute A-weighted (dBA) L_{10} , L_{90} , L_{eq} and L_{max} levels at

each measurement position throughout the duration of the survey. The table below shows the lowest measured L_{A90} noise level during the survey period, adjusted for incident façade reflections.

	Lowest Measured L_{A90} Noise Level		
	Daytime (07:00 – 23:00 hours)	Night-time (23:00 – 07:00 hours)	24 hours
Position 1	59	53	53
Position 2	54	49	49

7.0 DISCUSSION OF NOISE CLIMATE

Due to the nature of the survey, i.e. unmanned, it is not possible to accurately describe the dominant noise sources, or specific noise events throughout the entire survey period. However at the beginning and end of the survey period the dominant noise sources were noted to be from general traffic, nearby construction site activities and building services plant emissions.

8.0 PLANT NOISE EMISSION CRITERIA

Residential/Commercial Properties

We understand that the requirements of Camden Borough Council are as follows:

“ Noise levels at a point 1 metre external to sensitive facades shall be at least 5dB(A) less than the existing background measurement (L_{A90}), expressed in dB(A) when all plant/equipment are in operation “.

Based on the above criteria, and the results of the environmental noise survey, we therefore propose the following future plant noise emission criteria to be achieved (with all relevant plant operating simultaneously) at 1 metre from the nearest noise sensitive facades based on the minimum measured L_{A90} noise level.

	Noise Emission Limit (dBA)		
	Daytime (07:00 – 23:00 hours)	Night-time (23:00 – 07:00 hours)	24 hours
Position 1	54	48	48
Position 2	49	44	44

However, if the building services plant noise emission is tonal the criteria should be an extra 5dB more onerous.

9.0 PLANT NOISE ASSESSMENT

9.1 6th Floor Flat Roof (South)

We understand 4 items of building services plant are proposed for installation within a semi enclosed roof garden at 6th floor level on the Southern side of the building. The manufacturer's noise data for the 4 items of plant is presented below:

Location	Number	Building Services Plant	Sound Pressure Level dB(A) @ 1m
Southern Flat Roof	3	PURY-P300YGM-A	59 per unit = 64
	1	PURY-P400YGM-A	61
TOTAL			65

The nearest commercial window is estimated to be at a distance of 45 metres. Considering the reverberant nature of the semi-enclosed plant location, and taking distance attenuation into account, we calculate the total noise level at the commercial windows to be around 35dBA. This is below the Local Authority criterion, and hence should be considered to be acceptable without additional attenuation measures.

9.2 6th Floor Flat Roof North

We understand 2 items of building services plant serving the 6th floor are proposed for installation in the semi-enclosed roof garden at 6th floor level on the North side of the building. The manufacturer's noise data for the 2 items of plant is presented below:

Location	Number	Building Services Plant	Sound Pressure Level dB(A) @ 1m
Position 2	2	PURY-P500YGM-A	60 per unit = 63

The nearest commercial window is at approximately 25 metres. Taking distance attenuation and the reverberant nature of the space into account, we estimate the total noise level at the commercial window to be around 41dBA. This is below the Local Authority criterion, and hence should be considered to be acceptable without additional attenuation measures.

10.0 CONCLUSIONS

A detailed 24 hour daytime and night time fully automated environmental noise survey has been undertaken in order to establish the currently prevailing roof level environmental noise climate around the site.

Plant noise emission criteria have been recommended based on the results of the noise survey and in conjunction with the Local Authority.

An assessment has been undertaken to determine the resultant noise levels at the nearest commercial window due to the operation of the proposed plant based on

manufacturer's plant noise data.

The calculated noise level due to operation of the plant is below the Local Authority criterion. The plant should therefore be considered to be acoustically acceptable.

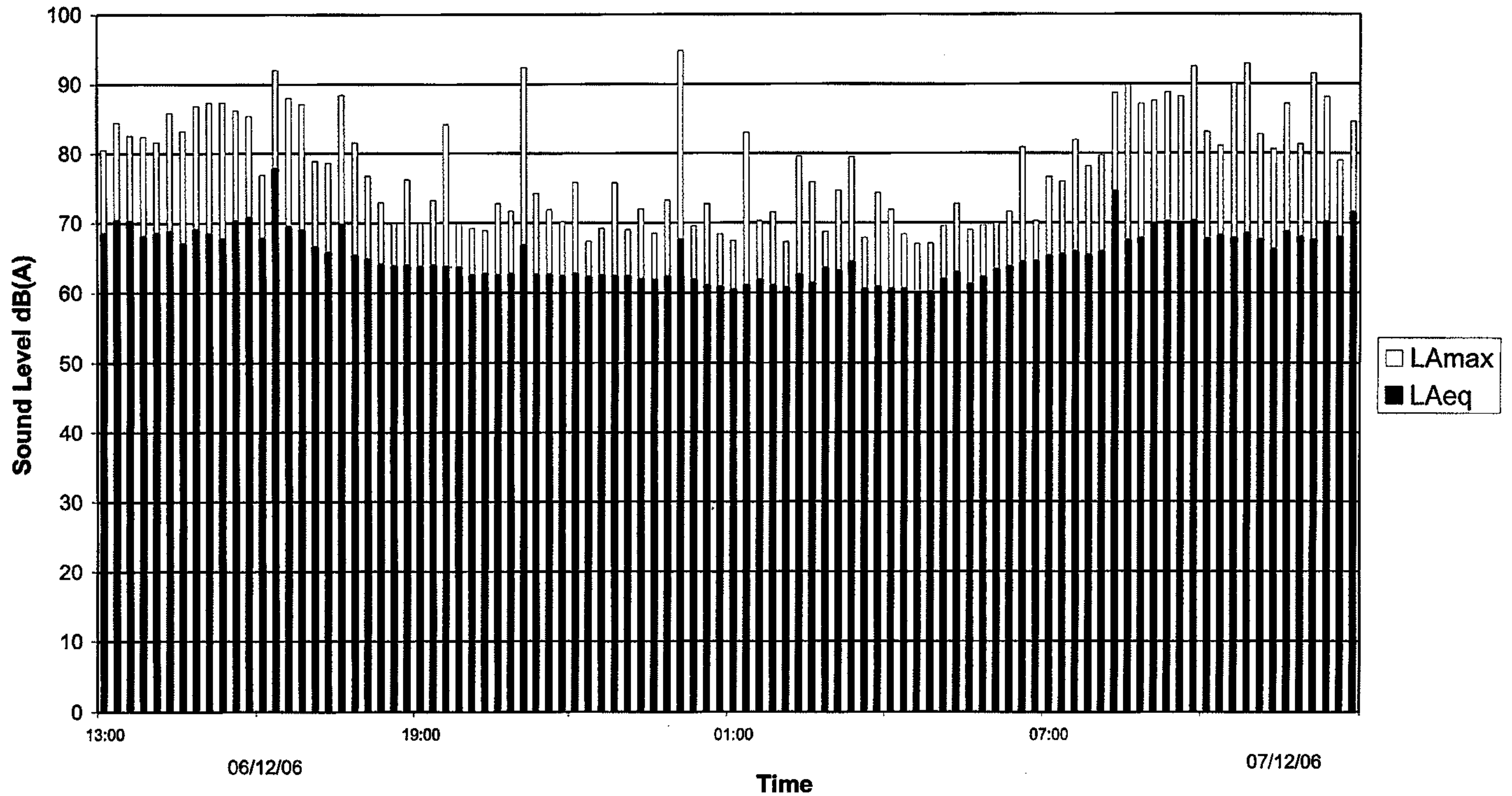


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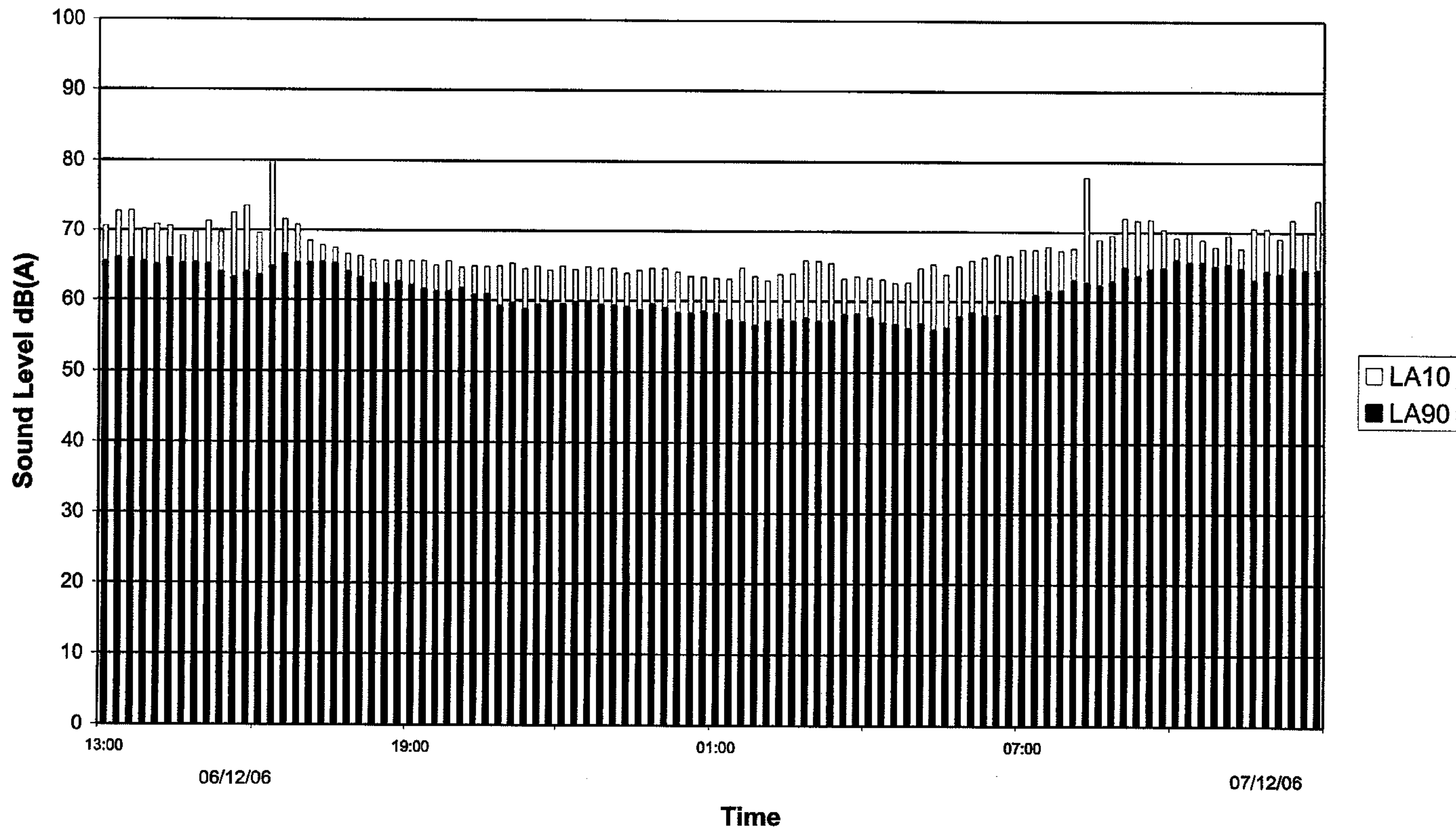


Checked by
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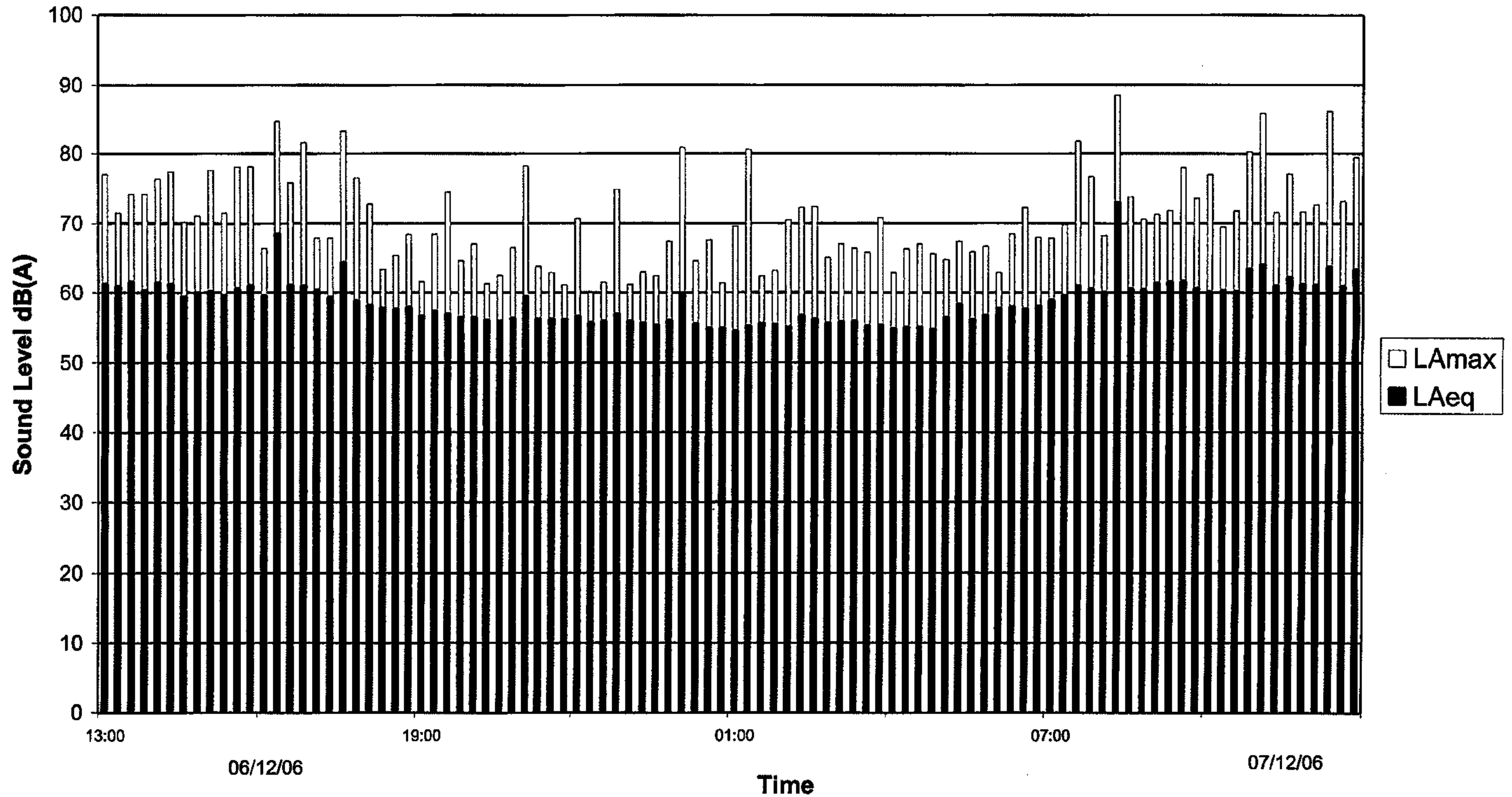
17 Charterhouse Street Position 1
Measured Leq and Lmax Noise Levels
06/12/2006 - 07/12/2006



17 Charterhouse Street Position 1
Measured L_{A10} and L_{A90} Noise Levels
06/12/2006 - 07/12/2006



17 Charterhouse Street Position 2
Measured Leq and Lmax Noise Levels
06/12/2006 - 07/12/2006



17 Charterhouse Street Position 2
Measured L_{A10} and L_{A90} Noise Levels
06/12/2006 - 07/12/2006

