## CASTLEBROW LIMITED

## NOISE ASSESSMENT FOR PROPOSED RESTAURANT AT 38 WARREN STREET

**JUNE 2010** 



ADDISCOMBE ENVIRONMENTAL CONSULTANTS LIMITED

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AECL\1317\02	June 2010	Signature
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#### FORWARD AND SUMMARY

#### Foreword

Castlebrow Ltd intends to redevelop the basement and ground floor of 38 Warren Street for use as a restaurant.

The London Borough of Camden, the local authority, require a noise assessment to be submitted as part of a planning application for all and any air conditioning systems which may have an impact on the external environment. Castlebrow Ltd has therefore commissioned Addiscombe Environmental Consultants Limited (AECL) to undertake an assessment of noise generated by the units and this report presents the results of the assessment.

Consideration is also given to other noise impacts which may occur from operation of the restaurant.

The property at 38 Warren Street is a five storey building and it is understood that there are existing vacant retail premises situated on the ground floor, and that the upper floors are occupied by offices.

#### Summary

A Noise Survey was carried out between 23:03hrs on Tuesday the  $11^{th}$  May 2010 and 00:03hrs on Wednesday  $12^{th}$  May 2010 and the lowest measured background noise level during the periods over which the site will operate was found to be 50.6 dB L<sub>A90.5 mins</sub>.

Noise from proposed fixed noise sources attributable to the operation of the proposed restaurant have been assessed. A Rating Level of 18.6 dB(A) has been calculated for noise from air conditioning units and this is 32 dB below the lowest background level, which indicates a positive indication that complaints are unlikely.

The sound pressure level from the unit is13.6 dB(A) at the closest residence, which is 37 dB below the measured background level, which complies with Camden's noise criteria.

Noise from the extract duct outlet has also been found to be meet Camden's noise limits, provided that the sound power level is limited to 81.6 dB(A).

Additionally, noise attributable to the day to day running of the restaurant has been considered and recommendations have been included in the conclusions.

This assessment finds that there are no reasons on noise grounds why planning permission should be refused.

This report has been prepared in accordance with the guidance provided by London borough of Camden: "Camden Council Noise Standards in Respect of Planning and Licensing Applications"

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#### 1. EXPERIENCE AND COMPETENCE

#### **1.1** Author qualifications and experience

- 1.1.1 The author; Edward Crofton-Martin holds an MSc from City University and is a full corporate member of the Institute of Acoustics, which is the United Kingdom's recognised official body for all matters related to Acoustics and Noise Control.
- 1.1.2 The author is a holder of the Institute's Postgraduate Diploma in Acoustics and Noise Control. Edward also holds the Institute of Acoustics Certificate of Competence in Environmental Noise Measurement and has over 6 years experience of responsible work in the field of Acoustics.
- 1.1.3 Edward Crofton-Martin is currently employed as a Senior Acoustic Consultant with Addiscombe Environmental Acoustic Consultants Ltd. contact details are provided at the front of this report.

#### 1.2 Employer details

1.2.1 This noise assessment was commissioned by Castlebrow Limited, of 38 Warren Street, London, W1T 6AE.

#### 2. INTRODUCTION AND SCOPE OF EVIDENCE

#### 2.1 Introduction

- 2.1.1 This report assesses noise generated by the operation of the proposed restaurant at 38 Warren Street, London, W1T 6AE
- 2.1.2 The assessment covers both fixed plant (air-conditioning units and the kitchen extract duct) and also other potential noise-generating activities.
- 2.1.3 The restaurant will be located in the ground floor and basement of 38 Warren Street. The main entrance will be in Euston Road and there are no residential properties close to the entrance.

#### 2.2 Scope of Evidence

- 2.2.1 The noise assessment has been undertaken using the following drawings provided by the Client:
  - Drawing No. 003. Basement Layout as Proposed (23.04.10)
  - Drawing No. 103. Ground Floor Layout as Proposed (23.04.10)
  - Drawing No. 203. Warren Street Elevation as Proposed (23.04.10)
  - Drawing No. 403. Lightwell Elevations as Proposed (23.04.10)
- 2.2.2 Sound pressure levels for the air-conditioning unit have been provided by the manufacturer.

#### 3. NOISE UNITS AND STANDARDS

#### 3.1 Noise Units

- 3.1.1 Noise is defined as unwanted sound. The range of audible sound is from 0 dB to 140 dB. The frequency response of the ear is usually taken to be about 18 Hz (number of oscillations per second) to 18000 Hz. The ear does not respond equally to different frequencies at the same level. It is more sensitive in the mid-frequency range than the lower and higher frequencies and because of this, the low and high frequency components of a sound are reduced in importance by applying a weighting (filtering) circuit to the noise measuring instrument. The weighting which is most widely used and which correlates best with subjective response to noise is the dB(A) weighting. This is an internationally accepted standard for noise measurements.
- 3.1.2 For variable noise sources such as traffic, a difference of 3 dB is just distinguishable. In addition, a doubling of traffic flow will increase the overall noise by 3 dB. The "loudness" of a noise is a purely subjective parameter, but it is generally accepted that an increase/decrease of 10 dB corresponds to a doubling/halving in perceived loudness.
- 3.1.3 External noise levels are rarely steady, but rise and fall according to activities within an area. In an attempt to produce a figure that relates this variable noise level to subjective response, a number of noise indices have been developed. These include:
  - i) The L<sub>Amax</sub> noise level;

This is the maximum noise level recorded over the measurement period and provides an indication of the highest noise levels registered during the measurement period.

ii) The L<sub>Aeg,T</sub> noise level;

This is the "equivalent continuous A-weighted sound pressure level, in decibels" and is defined in British Standard (BS) 7445 [1] as the "value of the A-weighted sound pressure level of a continuous, steady sound that, within a specified time interval, T, has the same mean square sound pressure as a sound under consideration whose level varies with time".

It is a unit commonly used to describe construction noise, noise from industrial premises and is the most suitable unit for the description of other forms of environmental noise.

iii) The L<sub>A10</sub> noise level;

This is the noise level that is exceeded for 10% of the measurement period and gives an indication of the noisier levels. It is a unit that has been used over many years for the measurement and assessment of road traffic noise

iv) The L<sub>A90</sub> noise level;

This is the noise level that is exceeded for 90% of the measurement period and gives an indication of the noise level during quieter periods. It is often referred to

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as the background noise level and is used in the assessment of disturbance from industrial noise.

- 3.1.4 In addition, the term "ambient noise" is often referred to. Ambient noise is defined in BS 4142: 1997 [2] as the "Totally encompassing sound in a given situation at a given time usually composed of sound from many sources near and far". It is commonly measured in terms of L<sub>Aeq,T</sub>.
- 3.1.5 The term "residual noise" is often referred to. Residual noise is defined in BS 4142: 1997 [2] as the "Totally encompassing sound in a given situation at a given time when the specific noise source is suppressed to a degree such that it does not contribute to the ambient noise level".

#### 3.2 Method of Assessing Industrial Noise From Commercial Premises

- 3.2.1 BS 4142 provides a method for rating industrial noise affecting mixed residential and industrial areas. It was first published in 1967 and has been extensively used by local authorities and consultants to rate noise from fixed installations, such as plant noise. The standard was considerably revised in 1990 and clarified in 1997 and advocates the use of L<sub>Aeq,T</sub>, a level, which is directly measurable and termed the Specific Noise Level when corrected for the duration of the noise. The Specific Noise Level is then corrected for character, if appropriate (see paragraph 3.2.2) and termed the Rating Level. When used to assess industrial noise, the Rating Level is determined and the L<sub>A90</sub> background level is subtracted from it. A difference of around 10 dB or higher indicates that complaints are likely. A difference of around 5 dB is of marginal significance. A difference of -10 dB is a positive indication that complaints are unlikely.
- 3.2.2 BS 4142 requires a +5 dB correction to be applied to the Specific Noise Level if the noise contains a distinguishable, discrete, continuous note (whine, hiss, screech, hum etc), or if there are distinct impulses in the noise (bangs, clicks, clatters, or thumps), or if the noise is irregular enough in character to attract attention. The Specific Noise Level then becomes the Rating Level.
- 3.2.3 BS 4142:1997 states that the assessment location should normally be freefield, however, when making measurements above ground floor level it states: 'choose a position which is 1m from the façade on the relevant floor of the building'. Measurements should be taken at a preferred height of between 1.2 and 1.5m above ground level.

#### 3.3 Local Authority Noise Criteria

- 3.3.1 The Environmental Health department at the London Borough of Camden has advised using their own noise guidance document "Camden Council Noise Standards in Respect of Planning and Licensing Applications" [3]. This Document also specifies the acceptable report format.
- 3.3.2 This Document requires that:

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

Where it is anticipated that any plant/equipment will have a noise that has a

distinguishable discrete continuous note (whine, hiss, screech, hum) and/or if there are distinct impulses (bangs, clicks, clatters, thumps) special attention should be given to reducing the noise levels from that piece of plant/equipment at any sensitive façade to at least 10dB(A) below the LA90, expressed in dB(A)."

3.3.3 Noise from the air-conditioning unit has been assessed using both the BS 4142 methodology and also Camden's noise criteria.

#### 4. SITE DESCRIPTION AND PROPOSED PLANT

#### 4.1 Site Description

- 4.1.1 The site is located on the ground and basement floors of 38 Warren Street, London. The building itself is five storeys in height, with the upper floors currently in use as offices. The ground floor is currently unoccupied and an on-site inspection showed that it runs through from 38 Warren Street at the south to 373 Euston Road at the north.
- 4.1.2 The site is located in a row of terraced buildings in a mixed commercial and residential area. The nearest residential dwelling is located at 34 Warren Street, approximately 15m directly south of the site. The location of the site is shown in Figure 1.
- 4.1.3 The site is bounded by Euston Road to the north, 'Tuckers' Solicitors and 'Euro Car Parks' Car Parking Management Services located at 367 Euston Road (backing on to 39 Warren Street), to the east. Warren Street to the south and Silver Levene Accountants based in the adjacent property at 373 Euston Road (backing on 37 Warren Street to the west).
- 4.1.4 The noise climate at the site is primarily influenced by continual road traffic noise from Euston Road to the north, which was observed as being a road subject to high traffic flows, as well as local traffic noise from Warren Street and nearby roads. In addition the noise climate was also attributable to pedestrian noise in the vicinity of the site monitoring position.
- 4.1.5 The proposed restaurant is due to operate between 07:00 hours to 24:00 hours for the purposes of maintenance and deliveries, with probable opening hours of 11:00 23:30 hours, although these have not been confirmed as finalised at the present time.

#### 4.2 Proposed Plant

- 4.2.1 The proposed site will feature a Mitsubishi PURY-P300YHM air conditioning unit located in the lightwell at ground floor level servicing approximately 40 internal outlets. Octave band noise levels have been provided by Mitsubishi and are presented in Appendix B. The unit is understood to generate a sound pressure level of 58.6 dB(A) at a distance of 1 metre when at maximum capacity.
- 4.2.2 The site is proposed to be operational between 07:00 24:00 hours seven days a week. The fans are anticipated to be on constantly during the site hours of operation.

#### 4.3 Secondary Noise Sources

- 4.3.1 The main additional source of noise from the proposed restaurant is likely to be from the extract ventilation duct. Currently no data has been provided on any ducting from the kitchen, and therefore no informed comment can be made. However it is expected that any ventilation ducts will run vertically up the lightwell in the centre of the building and terminate just below the existing head of the lift plant enclosure. The lightwell is situated approximately 22m north of the nearest noise sensitive receiver at 34 Warren Street.
- 4.3.2 The normal exit route for both customers and staff will be via the front doors onto Euston Road, via a lobby. There is a fire escape door situated in the side facing Warren Street,

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but this would normally be kept closed during periods that the restaurant is open to customers.

- 4.3.3 There will be an internal refuse store, and refuse will be taken up to the Warren Street frontage using the pavement hoist. It is understood that any refuse contractor will be appointed collect refuse only within the hours of 0700 -2200.
- 4.3.4 Deliveries are likely to occur between 07:00 and 11:00 hours to Warren Street. Background noise levels from road traffic and other sources will already be high during this period and no significant noise impacts are anticipated.
- 4.3.5 There is no dedicated parking for the restaurant and it is not anticipated that vehicle movements related to patrons' vehicles are likely to give cause for concern.

#### 5. NOISE MONITORING

#### 5.1 General

- 5.1.1 BS 4142 and Camden's noise criteria both use a method of assessment that compares background levels to the level of the noise from the unit. Therefore, a background noise survey was undertaken in order to establish the existing background noise levels.
- 5.1.2 An attended noise survey was from 23:03 hours on Tuesday 11<sup>th</sup> May 2010 to 00:03 hours on Wednesday 12<sup>th</sup> May 2010. This period was chosen as it is likely to be representative of the quietest period that the restaurant is proposed to operate over.
- 5.1.3 The noise monitor was located at 1m from the façade of the nearest noise sensitive receptor located at 34 Warren Street. The microphone was positioned at a height of 1.5m from the ground, with a direct line of sight to the site. The monitoring location is shown in Figure 1.

#### 5.2 Instrumentation

- 5.2.1 The following instrumentation was used for the noise survey:
  - Rion NL-32 Sound Level Meter (S/N 00640762)
  - Rion UC-53A Microphone (S/N 306634)
  - Rion NH-21 Preamplifier (S/N 11822)
  - Rion NC-74 Acoustic Calibrator (S/N 00110080)
- 5.2.2 All equipment is within current manufacturer's periods of calibration and calibration certificates are attached in Appendix A.
- 5.2.3 Before and after the survey period, the calibration of the instrumentation was checked using the acoustic calibrator and no significant drift was noted.

#### 5.3 Instrumentation Set-Up

- 5.3.1 The instrument was set to record the following noise metrics continuously over fiveminute periods:
  - L<sub>Aeq</sub>
  - L<sub>Amax</sub>
  - L<sub>A10</sub>
  - L<sub>A90</sub>
- 5.3.2 The frequency response of the meter was set to "A" and the time weighting was set to "Fast".
- 5.3.3 The meteorological conditions were dry and wind speeds were noted to be less than  $1 \text{m/s}^{-1}$ .

#### 5.4 Measurement Results

- 5.4.1 Full noise monitoring results are presented in tabular form in Appendix B.
- 5.4.2 The lowest measured background noise level during the periods over which the site will operate was found to be 50.6 dB L<sub>A90,5 mins</sub>.

#### 6. NOISE CONDITIONS IMPOSED BY LONDON BOROUGH OF CAMDEN

6.1 The noise requirements of the London Borough of Camden are that:

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

Where it is anticipated that any plant/equipment will have a noise that has a distinguishable discrete continuous note (whine, hiss, screech, hum) and/or if there are distinct impulses (bangs, clicks, clatters, thumps) special attention should be given to reducing the noise levels from that piece of plant/equipment at any sensitive façade to at least 10dB(A) below the LA90, expressed in dB(A)."

#### 7. NOISE ASSESSMENT

#### 7.1 BS 4142 Noise Assessment

- 7.1.1 Noise levels generated by the operation of the air-conditioning unit have been calculated at the nearest residential receiver (34 Warren Street). These levels are presented in Table 7.1 below.
- 7.1.2 Calculations have been carried out on a worst case scenario basis and assume a +5dB character correction for any possible tonal or impulsive characteristics.

Table 7.1: Noise Calculations for Air-Conditioning Units to Nearest Noise-Sensitive Residential Windows

Parameter	Calculations
Sound pressure Level at 1m from unit	58.6 dB(A)
Distance from window to air conditioning unit	25m
Distance correction (-20 log r)	-28.0dB
Correction for complete screening (unit located in light-well)	-20 dB
Façade correction	+3 dB
Predicted Sound Pressure Level at 1m from facade	13.6 dB(A)
BS4142 Character Correction	+5 dB
Rating Level (Specific Noise Level + Character Correction)	18.6 dB(A)
Background Noise Level	50.6 dB(A)
Difference between rating level and Background Noise Level	-32.0 dB

7.1.3 Table 7.1 indicates that the Rating Level is 32 dB lower than the lowest measured background level. Under the BS 4142 methodology, this represents a positive indication that complaints are unlikely.

#### 7.2 Local Authority Noise Criteria

7.2.1 The calculated noise level at the closest residential receptor is 13.6 dB L<sub>Aeq</sub>. This level is 37 dB below the lowest measured background level and therefore easily meets Camden's noise criteria.

#### 7.3 Noise from Extract Duct Outlet

- 7.3.1 The lowest measured background noise level during the period over which the plant is intended to operate was recorded as being 50.6 dB L<sub>A90, 5 mins</sub>.
- 7.3.2 Noise from the duct outlet is unlikely be tonal of impulsive and the sound pressure limit

at the closest noise sensitive receptor is therefore 45.6 dB  $L_{Aeq}$ . The maximum allowable Sound Power level for the duct outlet has been calculated and is presented in Table 7.2.

Parameter	Calculations
Distance from window to source	25 metres
Allowable sound pressure level at closest residential window (façade)	45.6dB(A)
Correction for façade	-3 dB
Distance correction (20 Log(r) –11)	+39 dB
Calculated maximum allowable Sound Power Level of duct outlet	81.6 dB (A)

7.3.3 The above calculations demonstrate that, provided the sound power level of the duct outlet does not exceed 81.6 dB(A), the local authority noise criteria will be met.

#### 8. CONCLUSIONS AND RECOMMENDATIONS

- 8.1 A noise survey has been undertaken and has concluded that, during the proposed operating hours of the site, the lowest existing background noise level is 50.6dB  $L_{A90,}$  (5mins).
- 8.2 During normal operation of the site a maximum sound pressure level attributable to the air conditioning unit of 13.6 dB(A) is anticipated at the closest residential properties. This is 37 dB below the lowest measured background level and therefore easily meets Camden's noise criteria.
- 8.3 A Rating level of 18.6 dB(A) has been calculated for the air conditioning unit and this is 32 dB below the lowest measured background level. Under the BS 4142 guidance, this represents a positive indication that complaints are unlikely.
- 8.4 In order to comply with Camden's noise criteria, the sound power level for the extract duct should not exceed 81.6 dB(A) when operating at maximum load.
- 8.5 It is unknown as to whether or not the proposed restaurant is likely to play amplified music during opening hours. It is currently assumed that the façade situated on Warren Street will comprise imperforate double glazing, as such noise from amplified music should not be an issue at the nearest noise sensitive receiver. However as entertainment noise is beyond the scope of this assessment a view should be taken by the Local Authority as to the nature of any licensing conditions for the proposed restaurant.
- 8.6 It is also understood that there are no residential dwellings facing the main restaurant entrance on Euston Road. However it would be considered good practice to employ slow-close hinge units on the doors, to prevent noise from slamming doors.
- 8.7 Noise from deliveries and rubbish collection are not anticipated to generate any significant noise impacts.
- 8.8 It is therefore concluded, that there are no reasons on noise grounds why planning permission for the site should not be granted.

#### 9. **REFERENCES**

- 1. British Standards Institution. British Standard 7445: Description and measurement of environmental noise. Guide to quantities and procedures.
- 2. BS 4142:1997. Method for rating industrial noise affecting mixed residential and industrial areas
- 3. Camden Council Noise Standards in Respect of Planning and Licensing Applications

FIGURES



#### **APPENDIX A**

**Calibration Certificates** 

С	ERTIFICATE OF CALIBRATION
Certificate Number Date of Issue	CAL010905 07/01/2009
Customer	Addiscombe Environmental Consultants Ltd
Sound Level Meter	Description of Instrument Rion NL-32 Sound Level Analyser [Serial No. 00640762] with Rion UC-53A Microphone [Serial No.315082] and Rion NH-21 Preamplifier [Serial No.11822] Fitted with a WS-10 foam windshield.
	The instrument successfully completed the Class 1 Periodic Tests of BS EN 61672.
Associated Calibrate	B & K 4226 S/N 2590976.
Date of Calibration	07/01/2009.
Test Procedure	\\Calibration Procedures\Current Approved Procedures\NL 31_32 Cal Procedure Approved Issue 1.xls \\Calibration Results Sheets\Current Approved Results Sheets\NL-31 Master 61672-3 Approved Issue 5 ( BK 2590976).xls
	Test procedures in accordance with BS EN 61672-3:2006. NOTE: Test 10.1 (Self Generated Noise with Microphone Installed) omitted.
Test Engineer	Ben MacIsaac
	APPROVED SIGNATORY

8	Measurement Systems
C	ERTIFICATE OF CALIBRATION
Certificate Number Date of Issue	CAL090901 01/09/2009
Customer	Addiscombe EC Ltd
	Description of Instrument
Calibrator	Rion NC-74 [Serial No. 00110080] With ½" adaptor type NC-74-002 fitted.
Date of Calibration	01/09/2009.
Test Procedure	\\Calibration Procedures\Current Approved Procedures\NC_74_Cal Procedure Approved Isue 1.xls \\Calibration Results Sheets\Current Approved Results Sheets\NC-74 Master 60942 Approved Issue 2 (BK 2590976).xls
	Test procedures in accordance with BS EN 60942: 2003 (Annex B)
Test Engineer	Amrat Patel
BEAUFOR	T COURT, 17 ROEBUCK WAY, MILTON KEYNES, MK5 8HL

#### APPENDIX B

Noise Monitoring Results

Table B1 : Background Noise Measurements

Noise Monitoring Results

:: 34 Warren Stree 11/05/2010 - 12/( el: Edward Crofton
Dove Ground: 1.5m

## Equipment

Type	Description	S/n
Rion NL-32	Sound Level Meter	340762
Rion UC-53A	Microphone	306634
Rion NH-21	Preamplifier	11822
Rion NC-74	Sound Level Calibrator	110080

# Calibration

	>
Calibration after survey re 94.0 dB	94.0

## ----nd noice

Background noise measuren	Ients					
Date / Time	Location	Duration	LAeq	LAmax	LA10	LA90
11/05/2010 23:03:31	1m from window of nearest receptor	5 Mins	60.8	74.6	62.4	53.8
11/05/2010 23:08:31	1m from window of nearest receptor	5 Mins	57.9	6.99	60.9	52.2
11/05/2010 23:13:31	1m from window of nearest receptor	5 Mins	58.5	73.3	60.6	52.4
11/05/2010 23:18:31	1m from window of nearest receptor	5 Mins	57.7	74.2	60.2	51.6
11/05/2010 23:23:31	1m from window of nearest receptor	5 Mins	60.1	75.5	62.7	54.0
11/05/2010 23:28:31	1m from window of nearest receptor	5 Mins	56.6	67.9	59.0	52.6
11/05/2010 23:33:31	1m from window of nearest receptor	5 Mins	57.7	74.7	59.6	51.5
11/05/2010 23:38:31	1m from window of nearest receptor	5 Mins	58.3	71.2	61.0	51.4
11/05/2010 23:43:31	1m from window of nearest receptor	5 Mins	60.5	78.3	60.9	51.4
11/05/2010 23:48:31	1m from window of nearest receptor	5 Mins	59.0	73.9	60.3	52.5
11/05/2010 23:53:31	1m from window of nearest receptor	5 Mins	57.5	69.1	59.9	50.9
11/05/2010 23:58:31	1m from window of nearest receptor	5 Mins	56.5	71.7	58.6	50.6



Table B2 : Octave Band Noise Data provided my Mitsubishi

PURY-P300YHM Model:

éc 1	Total dB(A)	58.6
а	8000	42.5

4000 45

2000 48.5

1000 53

**500** 

250 61

125 63.5

**63** 65

Frequency Hz Level dB

0
0
Q
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measured data for report

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