EPL:1890

30th September, 2011

Consort Environmental Services Consort House, Bone Lane, Newbury, Berks RG14 7TL



ACOUSTICS

Park House Greenhill Crescent Watford Herts WD18 8PH Telephone: 01923 213625 Fax: 01923 213863

BELGO - 67 KINGSWAY, LONDON WC2 NOISE ASSESSMENT REPORT

1.0 INTRODUCTION

It is proposed to remove five existing condenser units currently located at low level within an external yard area, and replace them with five new condenser units located on the main roof of the premises. The London Borough of Camden have requested that an assessment of atmospheric noise emissions from the proposed new plant items is undertaken in order to ensure the amenity of neighbouring properties is not compromised.

The Equus Partnership Ltd has therefore been commissioned to undertake a noise survey to establish existing background noise levels at the site, to discuss The London Borough of Camden's requirements regarding noise emissions and to carry out an assessment in light of these.

2.0 SITE LOCATION

The subject premises comprise a large seven storey commercial building located on the west side of Kingsway, to the north of the junction with Wild Court. The proposed plant location is on the main roof in an area already occupied by numerous plant items associated with other occupants of the building. The exact plant locations are shown on the drawing attached at *Appendix A*. The closest sensitive neighbouring property is the language college which occupies the premises to the west in Wild Court, the closest windows of which are approximately 9m from the proposed plant location. There is also a roof light on the main roof approximately 3.5m from the plant location, below which is office accommodation on the sixth floor of the subject premises

There does not appear to any residential accommodation in the immediate vicinity of the proposed plant location.

3.0 PLANT NOISE DATA

Manufacturer's noise data for the proposed plant are summarised on the attached schedule 1890/PN1.

Three of the new units (the restaurant cooling units) are required to operate only during trading hours (08.00-23.00), whilst the chiller and cellar cooler units are required to operate on a 24 hour basis.

4.0 ENVIRONMENTAL NOISE SURVEY

An environmental noise survey was undertaken between 14.00 on Thursday 21^{st} July and 12.00 Friday 22^{nd} July 2011. Measurements were taken on the main roof of the premises approximately well away from any reflective surfaces, with the L_{Aeq} and L_{A90} values being recorded over consecutive 15 minute periods. Please refer to *Appendix B* for an explanation of the acoustic terminology used above.

4.1 Instrumentation

The following instrumentation was used for the survey:

Brüel and Kjær Precision Sound Level Meter	Type 2260B
Brüel and Kjær 1/2" Condenser Microphone	Type 4189
Brüel and Kjær Sound Level Calibrator	Type 4230
Brüel and Kjær 1/2" Windshield	Type UA 0237

The sound level meter was calibrated prior to the survey and the calibration was checked upon completion. No drift was found to have occurred.

4.2 Survey Results

The measured levels were found to be influenced by mainly by noise from road traffic on Kingsway and from existing plant items. The lowest background noise level measured between 08.00 and 23.00 was 54 dB L_{A90} , whilst the lowest level measured during the night time period was 47 dB L_{A90} . The results of the survey are shown on the attached table *1890/T1*.

The weather during the survey period was warm and mostly dry.

5.0 ACOUSTIC DESIGN TARGETS

The London Borough of Camden have indicated that with respect to neighbouring sensitive properties they require that plant noise emissions rated in accordance with BS 4142:1997 should be controlled to a value 5 dB below the lowest measured ambient background noise level during the proposed operating periods, when assessed at 1m from the nearest window. Based on the results of the environmental noise survey this equates to the following criteria:

Criterion							
08.00-23.00	23.00-08.00						
49 dB(A)	42 dB(A)						

6.0 ASSESSMENT

The local authority requirement refers to BS 4142: 1997: ""Method For Rating Industrial Noise Affecting Mixed Residential and Industrial Areas". This standard presents an assessment methodology for determining the likelihood of complaints from occupiers of residential accommodation with respect to noise from fixed plant installations, and based on the guidance in the Standard the target recommended would be tending toward the position where complaints would be "unlikely". However, the "Scope" of this standard specifically states that it is to be used determine whether the magnitude of a noise "is likely to give rise to complaints from people residing in the building". (Emphasis added). As such, the scope of the standard clearly highlights that it is not intended to provide an assessment of the likely acceptability of noise experienced by commercial properties, and therefore the use of this Standard is arguably not appropriate in this situation where there are no residential neighbours. However, in order to comply with the local authority requirements, we shall refer to the Standard for the purposes of this assessment.

Based on the manufacturer's plant noise data and the acoustic design targets outlined above, an assessment of noise emissions from the proposed plant items has been undertaken, with due allowance made for the distance between the plant location and the identified neighbouring properties.

6.1 To Neighbouring College Building

Calculations show (see *Appendix C*) that with all five of the proposed new units operating simultaneously (which could only occur during the proposed trading hours of 08.00 - 23.00) the noise level at the closest window to the college building will be 40 dB(A), which is 14 dB below the minimum measured background noise level and therefore comfortably complies with the local authority requirement.

At night with the chiller and cellar cooling units running simultaneously the noise level at the closest window to the college building will be 35 dB(A), which is 12 dB

below the minimum measured background noise level and therefore also comfortably complies with the local authority requirement.

6.2 To Rooflight

During the proposed trading hours calculations show that with all five of the proposed new units operating simultaneously the noise level at the rooflight will be 48 dB(A), which is 6 dB below the minimum measured background noise level and therefore complies with the local authority requirement.

At night with the chiller and cellar cooling units running simultaneously the noise level at the rooflight will be 43 dB(A). This is 4 dB below the minimum measured background noise level and therefore marginally exceeds the local authority requirement, however we would contend that a 1dB excess is of no material significance especially since there are in fact no residential neighbours and the office accommodation would not be expected to be occupied during the night time period.

7.0 CONCLUSIONS

Noise emissions from the proposed plant items have been assessed based on manufacturer's noise data and in accordance with local authority requirements. Calculations confirm that the local authority requirement is generally achieved with the exception of a 1 dB excess at the rooflight to the fifth floor office accommodation within the subject premises during the night time period. However, given the marginal nature of this excess and the fact that the office accommodation is unlikely to be occupied during the night, this is not considered to be of any material significance.

Christopher Hookway THE EQUUS PARTNERSHIP LTD.

APPENDIX A

Roof Plan



NOTES		
1. DO NOT SCA	ALE.	
2. ALL DIMENSI ARE IN M.M.	ONS, EXCEPT	WHERE STATED,
3. ALL DIMENSI CHECKED, P	ons, where A rior to manu	APPLICABLE, TO BE JFACTURE.
4. THIS DRAWIN Consort, A Without Lic	IG IS THE COF ND MAY NOT E ENCE.	PYRIGHT OF BE REPRODUCED
A REVISED PLAN		BUS NE 04 10 11
REV. DESC	CRIPTION	DRN. CHKD. DATE
REV. DESC		DRN. CHKD. DATE
REV. DESC DESC BONE LANE, N TEL No. (01635)	CRIPTION	DRN. CHKD. DATE
REV. DESC DESC BONE LANE, N TEL No. (01635) CLIENT :	CRIPTION	DRN. CHKD. DATE
REV. DESC DESC BONE LANE, N TEL No. (01635) CLIENT : PROJECT :	CRIPTION	DRN. CHKD. DATE
REV. DESC DESC BONE LANE, N TEL No. (01635) CLIENT : PROJECT : KINC	CRIPTION	DRN. CHKD. DATE
REV. DESC DESC BONE LANE, N TEL No. (01635) CLIENT : PROJECT : KINC TITLE :	CRIPTION	DRN. CHKD. DATE
REV. DESC D	CRIPTION	DRN. CHKD. DATE
REV. DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC DESC D	CRIPTION	DRN. CHKD. DATE

APPENDIX B

Glossary of Acoustic Terminology

Decibel (dB):	The Decibel is a logarithmic unit used to express ratios of quantities such as sound pressure or sound power. The logarithmic nature of the unit means that decibel values cannot be added or subtracted in the usual way. An auditory sensation of halving or doubling of loudness equates to a decrease or increase of around 10 dB.
dB(A) or L	<u>۸</u> :	The A weighted scale is used to take account of the fact that the human ear is more sensitive to sounds at high frequencies than sounds at low frequencies. "A" weighted sound pressure level (sound level) measurements correspond roughly to the subjective impression of loudness of the average listener.
L _{max}	:	The L_{max} is the maximum sound pressure level (sound level) recorded during any given measurement period.
L ₉₀	:	The L_{90} is the sound level that is exceeded for 90% of the measurement period, and is generally considered to describe the background noise, since it inherently excludes the sounds of transient events.
L _{eq}	:	The L_{eq} index is used as a method of averaging temporally or spatially varying sound levels. At a given position, it may be defined as the notional sound level which contains the same amount of acoustical energy as the actual (time varying) sound level over the same measurement period. The L_{eq} index has gained wide acceptance for many types of noise assessment, and is now referred to within British Standards 4142 and 8233, and also within The Noise at Work Regulations.

APPENDIX C

Assessment Calculations

During Trading Hours

To College Building

Restaurant Condenser unit	52 dB(A) at 1m
3 off	+ 5 dB = 57 dB(A) at 1m
distance (9m)	-19 dB = 38 dB(A) = i
Chiller condenser unit	30 dB(A) at 10m
distance (9m)	+ 1 dB = 31 dB(A) = ii)
Cellar Cooler Condenser Unit	31 dB(A) at 10m
distance (9m)	+ 1 dB = 32 dB(A) = iii)
Specific Noise Level = i) + ii) + iii)	40 dB L _{Aeq, 1hr}
Character correction	0
Rating Noise Level	40 dB L _{Ar, 1hr}
Minimum Background Noise Level	54 dB L _{A90, 15 min}
Rating Level relative to Background	- 14 dB

To Rooflight

Restaurant Condenser unit	52 dB(A) at 1m
3 off	+ 5 dB = 57 dB(A) at 1m
distance (3.5m)	-11 dB = 46 dB(A) = i
Chiller condenser unit	30 dB(A) at 10m
distance (3.5m)	+9 dB = 39 dB(A) = ii
Cellar Cooler Condenser Unit	31 dB(A) at 10m
distance (3.5m)	+9 dB = 40 dB(A) = iii
Specific Noise Level = i) + ii) + iii)	48 dB L _{Aeq, 1hr}
Character correction	0
Rating Noise Level	48 dB L _{Ar, 1hr}
Minimum Background Noise Level	54 dB L _{A90, 15 min}
Rating Level relative to Background	- 6 dB

n.b. The above calculations assume a worst case condition where all units are running simultaneously. Façade corrections have not been included since this effect would be applied to both the measured background noise level and the calculated plant noise levels, and so would cancel out.

Outside Trading Hours

To College Building

30 dB(A) at 10m
+ 1 dB = 31 dB(A) = i)
31 dB(A) at 10m
+ 1 dB = 32 dB(A) = ii)
35 dB L _{Aeg, 5 min}
0
35 dB L _{Ar, 5 min}
47 dB L _{A90, 15 min}
- 12 dB

To Rooflight

Chiller condenser unit	30 dB(A) at 10m
distance (3.5m)	+9 dB = 39 dB(A) = i
Cellar Cooler Condenser Unit	31 dB(A) at 10m
distance (3.5m)	+ 9 dB = 40 dB(A) = ii)
Specific Noise Level = i) + ii)	43 dB $L_{Aeq, 1hr}$
Character correction	0
Rating Noise Level	43 dB L _{Ar, 1hr}
Minimum Background Noise Level	47 dB L _{A90, 15 min}
Rating Level relative to Background	- 4 dB

n.b. The above calculations assume a worst case condition where all units are running simultaneously. Façade corrections have not been included since this effect would be applied to both the measured background noise level and the calculated plant noise levels, and so would cancel out.

SCHEDULE OF PLANT NOISE LEVELS

SCHEDULE: 1890/PN1

SHEET NO. 1 OF 1

DATE: 30th September 2011

BELGO - 67 KINGSWAY, LONDON WC2



PLANT REF.	MODEL	LOCATION	No. Off	Pa.	Lw / Lp	63	125	250	500	1k	2k	4k	8k
Restaurant Condenser Unit	Mitsubishi PURY-RP125	6th Floor Roof	3	N/A	Lp @ 1m				52	dB(A)			
Chiller Unit	JEHS-0200-M3	6th Floor Roof	1	N/A	Lp @ 10m				30	dB(A)			
Cellar Cooler Unit	JEHS-0250-M3	6th Floor Roof	1	N/A	Lp @ 10m				31	dB(A)			

Lw = Sound Power Level (dB. re. 1 pico Watt).

Lp = Sound Pressure Level (dB. re. 20 micro Pascals).