Tally Ho Public House
Redevelopment Site
Kentish Town
London

ENVIRONMENTAL NOISE SURVEY
AND PLANT NOISE ASSESSMENT
REPORT 11935/ENS4

For :

Accent BDA Ltd
Grove Mews
42 The Grove
London
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22 April 2005

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REPORT 11935/ENS

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1.0 INTRODUCTION

New items of plant are proposed at podium roof level of a new residential development on the site of Tally Ho Public House, Fortress Road, Kentish Town, London. Hann Tucker Associates have therefore been commissioned to undertake a detailed environmental noise survey of the site.

This report presents the results of the survey. In addition the survey data has been used as the basis for recommending plant noise emission criteria and for undertaking an assessment of the proposed external items of new plant.

2.0 OBJECTIVES

To establish, by means of detailed 72 hour fully automated environmental noise monitoring, the existing A-weighted (dBA) L_{10}, L_{90}, L_{eq} and L_{max} environmental noise levels at a selected accessible position at roof level of the existing property.

Based on the results of the noise survey, and in conjunction with Camden Council, to recommend suitable plant noise emission criteria and to undertake an assessment of the proposed item of plant.

3.0 SITE DESCRIPTION

The site lies within a mixed commercial and residential area. It is bounded by Highgate Road to the West, Fortress Road to the East, and Fortress Walk to the North.

4.0 ACOUSTIC TERMINOLOGY

The acoustic terms used in our 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 Ln 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 15:00 hours on Thursday 16 September 2004 to 10:00 hours on Monday 20 September 2004.

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 light and the sky was generally patchy cloud. We understand that generally throughout the survey period the weather conditions were similar to this.

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

5.2 Measurement Position

The noise level measurements were undertaken at one position on the roof of the existing Tally Ho Public House, which was selected in order to assess the current noise climate believed to be representative of that at the closest potentially affected noise sensitive residential property. The microphone was mounted on a pole overlooking Highgate Road and Fortress Road.

The approximate location of the measurement position A is indicated on the enclosed Site Plan 11935/SP1.

5.3 Instrumentation

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

Description	Manufacturer	Type
Type 1 Data Logging Sound Level Meter	Larson Davis	820
Type 1 ½ Condensor Microphone	Larson Davis	2541
Type 1 Calibrator	Larson Davis	CAL200

The sound level meter, including the extension cable, was calibrated prior to and on completion of the survey. No significant change was found to have occurred.

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

6.0 RESULTS

The results have been plotted on Time History Graphs 11935/TH1 and 11935/TH2 enclosed presenting the 15 minute A-weighted (dBA) L_{10}, L_{90}, L_{eq} and L_{max} levels at the measurement position throughout the duration of the survey.

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 local road traffic and music from the concert hall located to the West of the site.

Report No. 11987.R0
October 2004

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TALLY HO PUB SITE, FORTRESS ROAD, KENTISH TOWN

HVAC PLANNING REPORT

TALLY HO PUB SITE, FORTRESS ROAD, KENTISH TOWN

HVAC PLANNING REPORT

CONTROLLED DOCUMENT

Gifford and Partners Document No:	**11987.R0**		
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TALLY HO PUB SITE, FORTRESS ROAD, KENTISH TOWN

HVAC PLANNING REPORT

C O N T E N T S

1. INTRODUCTION

This report describes the current heating, cooling and ventilation proposals for the retail section of the Tally Ho Pub Site project in Kentish Town, London. The project consists of 3No retail areas at ground floor below a residential building.

Usually Heating, comfort cooling, and fresh air are all required for retail areas.
Due to high occupancy and lighting loads for retail spaces, comfort cooling is normally required to achieve comfortable conditions for the workforce and the cliental.
Heating and cooling for this type of project are usually combined to reduce on plant space and maintenance.
Fresh air is also required for the occupancy at a recommended 8 litres / second / person for non-smoking establishments in accordance with CIBSE.

Noise levels are an issue for this type of project where retail heating, cooling and ventilation external plant is located close to residential buildings. The plant described in the acoustic report by Hann Tucker Associates is an indication of the type of plant that will be installed externally. These units have been based on Daikin Heat recovery and condenser units however the manufacturer and type of unit may change.

2. RETAIL AREA

2.1 Heating and Cooling

Heating and cooling will be provided via a combined heating and cooling system, produced by a VRV (heating and cooling) internal units located in the ceiling voids within the retail space. The VRV internal units are connected to an external condenser unit for each of the retail areas. The heat produced by the retail space will be rejected by the condenser unit (refer to external areas and heat rejection)

Fresh air will be introduced to each of the retail areas via an architectural external louver at high level above the shop front.
A mini air-handling unit per retail space will be located in the ceiling void; this will treat the primary fresh air before it is introduced to the space. The air-handling units will be provided with electric heating and a refrigerant DX coil. A heat exchanger will be optional to reduce on energy consumption.
Rather than introducing the fresh air directly to the space it will be distributed to each of the fan coil units and mixed with the re-circulated air from the space.

Attenuation will be provided on the ductwork of the fresh air systems.

3. EXTERNAL AREAS

3.1 Heat Rejection

Heat rejection from the retail space is provided by 3No external air-cooled condenser units strategically positioned on the Podium level above the retail area.

Heat rejection from the internal fresh air units will be provided via an external condenser connected to each unit, these will be strategically positioned on the Podium level above the retail area

The units draw cooler air through either the sides or the rear of the units; pass the air over cool refrigerant coils via a fan and discharge warm air either at the top or the front of the units.

The units which utilise fans to reject the heat generate noise (refer to acoustic report) and therefore will either need to be strategically positioned or acoustically treated to satisfy the local governments minimum noise levels.

The noise levels of the units are as follows:

- Condenser Unit – 57db(A)
- Heat Recovery Unit – 60 dB(A)

For the units to meet with Camden Councils requirements, noise levels must be 5dB(A) below the current prevailing L_{A90} noise level and meet the following Noise Emission Limits given by Hann Tucker.

- Daytime – 49dB(A)
- Night Time – 45dB(A)

- 24 Hrs – 45dB(A)

The units will be hidden / disguised within an architectural feature. These features will be designed in accordance with the VRV manufacturer's requirements.

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Frogbox Technical Information

RETAIL SYSTEM SOLUTIONS

Noise Measurement Information

Test: Standard sized Frogbox Retail System with dimensions 1500x2500x2400 (Latitude x Longitude x High)

All Measuring conformable with:

EN ISO 11957: Acoustics – Determination of sound insulation performance of cabin – Labory and in situ measurements
EN ISO 717 – 1: Acoustics – Rating of sound insulation in buildings and of building elements – Part 1: Airbone sound insulation

Sound Level Measuring Equipment

Sound Analyser B&K type 2145 b.n. 2000272 s BZ 5048
Measuring microphone B&K 4155 b.n. 1394590
Pistonphone B&K 4220 v.c.613837

Certified Sound Isolation Data

Part	D'_w (dB)	R'_w (dB)
front flank of system	35	-
right flank of system	39	-
back flank of system	37	-
left flank of system	38	-
Whole system	38	37

Note: All noise measurements taken at 1 metre from test unit.

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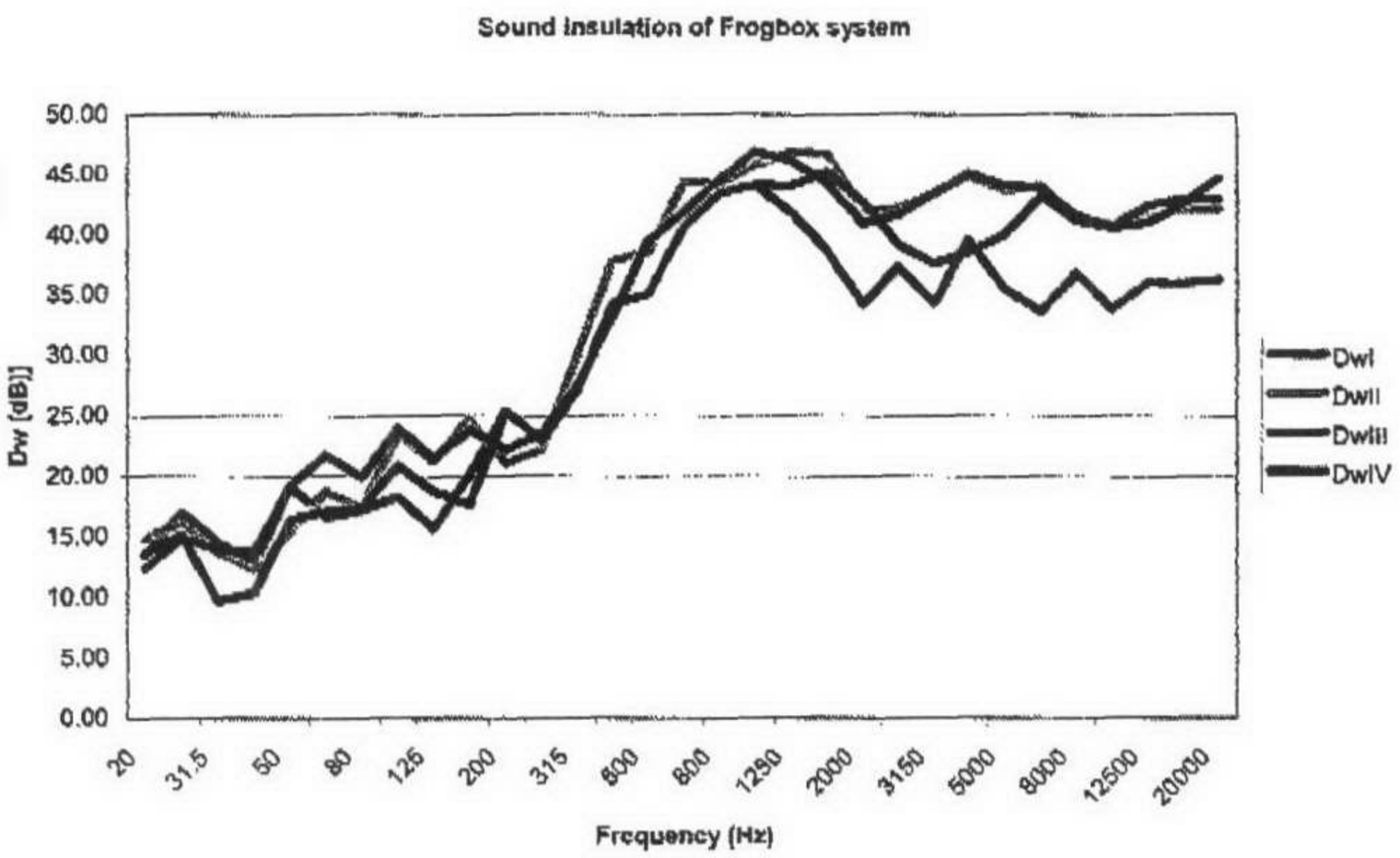
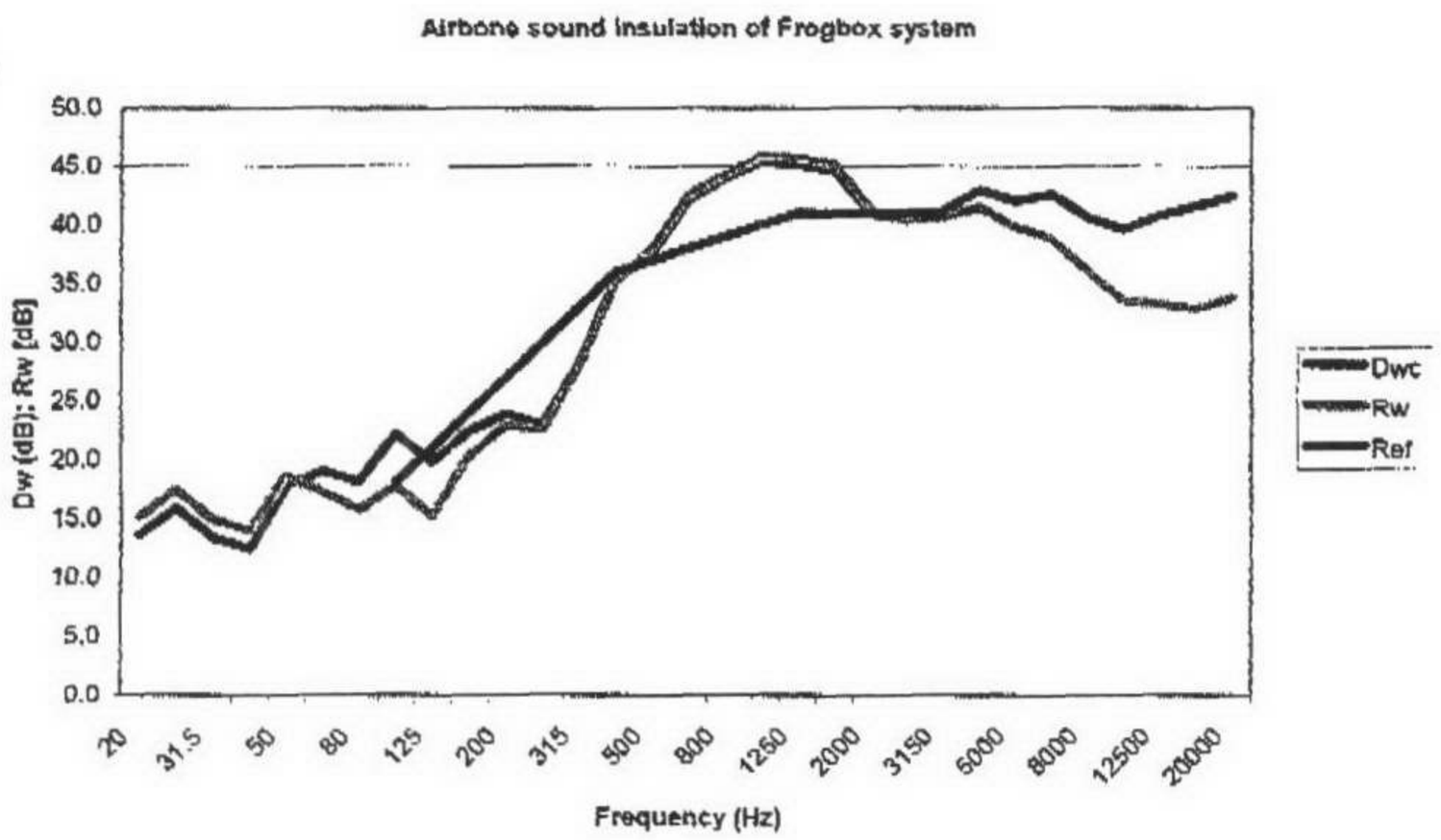
Frogbox Technical Information

RETAIL SYSTEM SOLUTIONS

Sound insulation and airborne sound insulation of Frogbox Refrigeration System





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Frogbox Technical Information

RETAIL SYSTEM SOLUTIONS

Certified Sound Level Data

(Hz)	(dB)										
Frequency	Dwi	Dwii	Dwiii	DwiV	Dwc	Rw	Ref	S (m2)	V (m3)	T (s)	A (m2)
20	13.41	14.80	13.63	12.40	13.6	15.2		23.2	1000	10.000	16.3
25	17.00	16.22	15.21	14.91	15.9	17.4		23.2	1000	10.000	16.3
31.5	14.60	13.76	9.71	14.02	13.4	14.9		23.2	1000	10.000	16.3
40	12.68	12.33	10.34	13.68	12.4	14.0		23.2	1000	10.000	16.3
50	19.10	15.44	16.38	19.17	17.8	18.6		23.2	1000	8.474	19.2
63	16.58	18.73	17.09	21.72	19.0	17.2		23.2	1000	4.650	35.1
80	17.16	17.36	17.36	19.89	18.1	15.8		23.2	1000	4.114	39.6
100	18.27	23.48	20.85	23.96	23.2	17.7	18	23.2	1000	2.534	64.3
125	15.67	21.20	18.78	21.44	19.8	15.2	21	23.2	1000	2.428	67.1
160	20.04	24.68	17.61	23.79	22.4	20.2	24	23.2	1000	4.266	38.2
200	25.42	21.07	25.42	22.20	23.9	23.0	27	23.2	1000	5.622	29.0
250	22.90	22.18	22.90	23.48	22.9	22.5	30	23.2	1000	6.362	25.6
315	27.16	29.99	27.16	27.49	28.1	28.0	33	23.2	1000	6.754	24.1
400	34.29	37.84	34.29	33.22	35.3	35.2	36	23.2	1000	6.802	24.0
500	35.10	38.58	35.10	39.50	37.5	37.9	37	23.2	1000	7.606	21.2
630	40.66	44.34	40.66	41.88	42.2	42.6	38	23.2	1000	7.806	20.9
800	43.49	44.28	43.49	44.60	44.0	44.3	39	23.2	1000	7.464	21.8
1000	44.12	45.77	44.12	46.89	45.4	45.8	40	23.2	1000	7.742	21.1
1250	41.83	46.87	44.11	46.16	45.2	45.7	41	23.2	1000	7.926	20.6
1600	38.65	46.72	45.17	44.27	44.5	45.1	41	23.2	1000	8.006	20.4
2000	34.22	42.04	42.77	40.95	41.0	41.2	41	23.2	1000	7.474	21.8
2500	37.35	42.20	39.16	41.64	40.5	40.4	41	23.2	1000	6.888	23.7
3150	34.28	43.39	37.61	43.46	41.2	40.6	41	23.2	1000	6.194	26.3
4000	39.56	44.88	38.55	45.07	43.0	41.5		23.2	1000	5.032	32.4
5000	35.50	43.76	40.03	44.20	42.0	39.8		23.2	1000	4.208	38.7
6300	33.63	44.11	43.18	43.81	42.6	38.9		23.2	1000	2.968	54.9
8000	36.81	41.22	41.16	41.57	40.6	35.9		23.2	1000	2.400	67.9
10000	33.81	40.70	40.54	40.69	39.7	33.5		23.2	1000	1.702	95.8
12500	36.01	41.48	40.98	42.39	40.8	33.2		23.2	1000	1.230	132.5
16000	35.98	42.14	42.56	43.00	41.6	32.9		23.2	1000	0.936	174.1
20000	36.31	42.10	44.70	42.93	42.4	33.7		23.2	1000	0.952	171.2
D'w	35	39	37	38	38	-					
R'w	-	-	-	-	-	37					

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Our Ref: HT: 11935/HA.sgm/ha

22 April 2005

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25 MAY 2005

Dear Thasha

RE: TALLY HO – PUBLIC HOUSE, FORTRESS ROAD, KENTISH TOWN LONDON

Further to your recent telephone call dated 22 April 2005, we are pleased to confirm the following.

Please find attached our Environmental Noise Survey and Plant Noise Assessment Report 11935/ENS4, pertaining to the above project.

The proposed locations of the VRVs and condensers on the first floor level will meet the plant noise emission criteria and will comply with Camden Council's requirements, providing the proposed plants are still enclosed in the Frog Box.

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

Yours sincerely
for HANN TUCKER ASSOCIATES

Hasan Akil

cc Paul Cook - Accent BDA
Richard C Leslie - Dukelease Properties Ltd

8.0 PLANT NOISE EMISSION CRITERIA

The existing Tally Ho Public House lies within the Camden Council boundaries. The Council states that noise levels from any new items of building services plant, when measured at a point 1 metre external to neighbouring residential sensitive facades, shall be at least 5dB below the currently prevailing L_{A90} noise level (during the period that the plant would be operational).

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 residential facades based on the minimum measured L_{A90} noise level.

Noise Emission Limit		
Daytime (07:00 - 23 :00 hours)	**Night Time (23:00 - 07:00 hours)**	**24 Hrs**
49 dB(A)	45 dB(A)	45 dB(A)

It should be noted that the above criteria are subject to final approval by Camden Council Environmental Health Department.

9.0 PLANT NOSE ASSESSEMENT

We understand that the items of plant to be installed on the roof comprise 3No VRV Heat Recovery units and 3No Heating/Cooling Condensing units.

The following table presents the manufacturers noise levels for the unattenuated podium mounted external VRV and Condenser plant:-

Plant Type	Model No.	Sound Pressure Level Measured @ 1m
Mitsubishi VRV Heat Recovery Units	3 No FDCP280H.KXE2	61 dB(A)
Daikin Heating and Cooling Condenser	3No R(Y)P20087W1 or 3No R(Y)P25087W1	57 dB(A) 57 dB(A)

We have assumed that the plant items will be operational 24 hours a day.

We understand the nearest neighbouring residential buildings will be located as follows:

Nearest Residential Neighbours	Distance from VRV Units	Distance from Condenser Units
@ 7a Fortress Road	5.5 to 10.5m	12m
@ 10 Highgate Road	5.0 to 9.5m	3m
@ Flats within Development Site (previously Tally Ho Public House	3.0 to 6.5m	2.5m

Calculations clearly show that noise levels, to be measured at 1m from the above nearest residential neighbours, from the above unattenuated podium mounted 3.x VRV and 3 x Condenser plant will exceed the overall plant noise emission limits required by Camden Council and defined in Section 8 of this Report.

It has therefore been agreed with Messrs Gifford (the Services Engineers) to install the VRV and Condenser plant items within fully enclosed bespoke attenuation packages, as manufactured by The Frogbox Company Ltd. The technical information supplied by Frogbox for their attenuation packages indicates the following noise levels would result:-

Plant in Frogbox Enclosures	Sound Pressure Level Measured @ 1m
Mitsubishi VRV Unit	34 dB(A)
Daikin Condenser Unit	30 dB(A)

When reviewing the above Frogbox Enclosure noise levels, relative to the distances from the various plant items to the distances from the various plant items to a distance of 1m from the nearest residential properties, the following resultant combined attenuated plant noise levels will be achieved:-

Nearest Residential Neighbours	Resultant Combined Plant Noise Levels
@ 7a Fortress Road	31.5 dB(A)
@ 10 Highgate Road	36.5 dB(A)
@ Flats within Development Site (previously Tally Ho Public House	39.0 dB(A)

The foregoing attenuated combined plant noise levels show more than adequate compliance with Camden Council's requirements, as defined in Section 8 of this Report.

10.0 CONCLUSIONS

A detailed 72 hour fully automated environmental noise survey has been undertaken in order to establish the currently prevailing environmental noise climate at the proposed location of the new item of plant.

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

Our subsequent plant noise emission calculations show that, with the proposed Frogbox Acoustic Enclosures fitted to the 3 x VRV and 3 x Condenser units to be installed on the development site, the atmospheric noise emission from the proposed plant should be more than acceptable to Camden Council.

Stuart G Morgan
HANN TUCKER ASSOCIATES