



24 Bell Street
Romsey
SO51 8GW

T: 01794 515999
F: 01794 515100

**MINERVA HOUSE, TELEPHONE EXCHANGE AND FITZROY HOUSE
NORTH CRESCENT, LONDON
PLANT NOISE IMPACT ASSESSMENT**

Technical Report: R3373-1 Rev 1

Date: 14th September 2010

For: PHQ Ltd
c/o DE&J Levy LLP
Dukes Court
32 Duke Street
London
SW1Y 6DF

24 Acoustics Document Control Sheet

Project Title: Minerva House, Telephone Exchange and Fitzroy House - Plant Noise
Impact Assessment

Report Ref: R3373-1 Rev 1

Date: 14th September 2010

	Name	Position	Signature	Date
Prepared by	Ed Pratt BSc AMIOA	Junior Consultant		
Approved by	Stephen Gosling BEng (Hons) MIOA MAES	Principal Consultant		
For and on behalf of 24 Acoustics Ltd				

Document Status and Approval Schedule

Revision	Description	Prepared By	Approved By
0	Approved For Issue	Ed Pratt	Steve Gosling
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1.0 INTRODUCTION

- 1.1 PHQ Ltd has instructed 24 Acoustics Ltd to undertake a plant noise impact assessment of proposed comfort cooling plant for offices in North Crescent, London.
- 1.2 This report presents the results of the assessment, following the site visit and background noise surveys undertaken between the 2nd and 3rd June 2010
- 1.3 All noise levels in this report are presented in dB relative to 20 μ Pa.

2.0 SITE DESCRIPTION

- 2.1 Minerva House, The Telephone Exchange and Fitzroy House are office buildings located off Tottenham Court Road in a predominantly commercially area.
- 2.2 The proposed plant will operate only during office hours. For plant serving the Telephone Exchange and Fitzroy House, the nearest residential properties are in Huntley Street and 9 Chenies Street (to the north east of the properties).
- 2.3 For plant serving Minerva House, there are no residential properties close to the proposed ground floor location (which already contains a significant amount of cooling plant).

3.0 CRITERIA

PPG 24 (Planning and Noise)

- 3.1 Planning Policy Guidance (PPG) 24 [Reference 1] provides guidance on how the planning system can be used to minimise the adverse impact of noise without placing unreasonable restrictions on development or adding unduly to the administrative burdens of business.
- 3.2 The PPG gives guidance to local authorities in England on the use of their planning powers to minimise the adverse impact of noise. It outlines the considerations to be taken into account in determining planning applications; both for noise-sensitive developments and for those developments which will generate noise.

BS 4142 (Method for Rating Industrial Noise Affecting Mixed Residential and Industrial Areas)

- 3.3 For noise from industrial developments, PPG 24 recommends the use of British Standard 4142 [Reference 2].
- 3.4 BS 4142 provides a method for rating the effects of industrial noise on mixed residential and industrial areas. The standard advocates a comparison between the typical measured L_{A90} background noise level and L_{Aeq} noise level from the source being considered. For rating purposes if the noise source is tonal, intermittent or otherwise distinctive in character, a rating correction of +5 dB is applied. The standard states that a difference between the rating level and the background level of +10 dB indicates that 'complaints are likely', a difference of +5 dB is of 'marginal significance' and a difference of -10 dB is a 'positive indication that complaints are unlikely'.

Local Authority Requirements

- 3.5 The Local Planning Authority, Camden Council, has advised that noise arising from fixed plant should be at least 5 dB below the typical prevailing background noise level. Where the noise character is likely to have an undesirable effect (eg, tonal or impulsive sound) then the cumulative level from all plant should be 10 dB below the background noise level.
- 3.6 For plant affecting offices, the overall noise level externally should not exceed 55 dB L_{Aeq} (assuming a reduction of 15 dBA between outside and inside) to comply with the requirements of BS 8233: 1999.

4.0 NOISE MEASUREMENTS AND RESULTS

- 4.1 Background noise measurements were taken over the period between the 2nd and 3rd June 2010. Measurements were undertaken at roof level at two locations to the rear of the office buildings, as shown in Figure 1. Location 1 was at Minerva House; Location 2 was on the boundary at the rear of the Telephone Exchange and Fitzroy House.
- 4.2 The sound level instrumentation was set up to monitor noise levels continuously and store data in 5-minute samples (using fast time weighting) in terms of the overall A-weighted L_{eq} , L_{90} and L_{max} sound pressure levels. A definition of the acoustic terminology used in this report is provided in Appendix A.
- 4.3 The following instrumentation was used during the survey:
- Rion NL31 (Type 1) precision grade sound level meter;
 - Rion NL31 (Type 1) precision grade sound level meter;
 - Brüel and Kjær Type 4231 acoustic calibrator.
- 4.4 Calibration was checked before and on completion of the measurements and no drift was recorded. The weather on the day of the survey was dry with wind speeds below 5 m/s. Noise measurements were made in accordance with BS 7445: 1991 'Description and measurement of environmental noise Part 2 - Acquisition of data pertinent to land use' [Reference 3].

Results

- 4.5 The results of the environmental surveys are presented in graphical format in Figures B1 and B2 showing the recorded $L_{Aeq, 5 \text{ min}}$, $L_{A90, 5 \text{ min}}$ and $L_{Amax, 5 \text{ min}}$ values.
- 4.6 With reference to the measured data, the following background noise levels have been determined for the proposed hours of operation:

Minerva House

- 06:00 – 21:30 hours 50 dB $L_{A90, 15 \text{ min}}$

The Telephone Exchange / Fitzroy House

- 06:00 – 21:30 hours 47 dB $L_{A90, 15 \text{ min}}$

Assessment

- 4.7 Based upon the requirements of the Local Planning Authority, noise from the plant should not exceed the following levels as measured at the nearest noise residential property (the character of noise from the equipment will not be tonal):

Minerva House

- 06:00 – 21:30 hours 45 dB $L_{Aeq, 15 \text{ min}}$

The Telephone Exchange / Fitzroy House

- 06:00 – 21:30 hours 42 dB $L_{Aeq, 15 \text{ min}}$

- 4.8 As noted above, noise affecting offices should not exceed 55 dB L_{Aeq} (assuming a reduction of 15 dBA between outside and inside) to comply with the requirements of BS 8233: 1999.

5.0 PLANT NOISE ASSESSMENT

Minerva House

- 5.1 No new plant is planned at roof level.
- 5.2 Eight new condenser units are planned at ground floor level of Minerva House. The overall sound pressure level per unit is 61 dBA at 1m and the predicted noise level at the nearest office façade would be 52 dB L_{Aeq} (assuming a semi reverberant environment). This would meet the external free-field requirement given above of 55 dBA for offices.

The Telephone Exchange

- 5.3 The proposal includes for a new air handling unit (operating at 57 dBA at 1m) and four condensing units (operating at 61 dBA at 1m) at second floor level on the Telephone Exchange Building. The nearest affected property would be to north east in Huntley Street at a distance of approximately 60m. The resultant noise level would be in the order of 24 dBA and hence meet the requirements set out above.

Fitzroy House

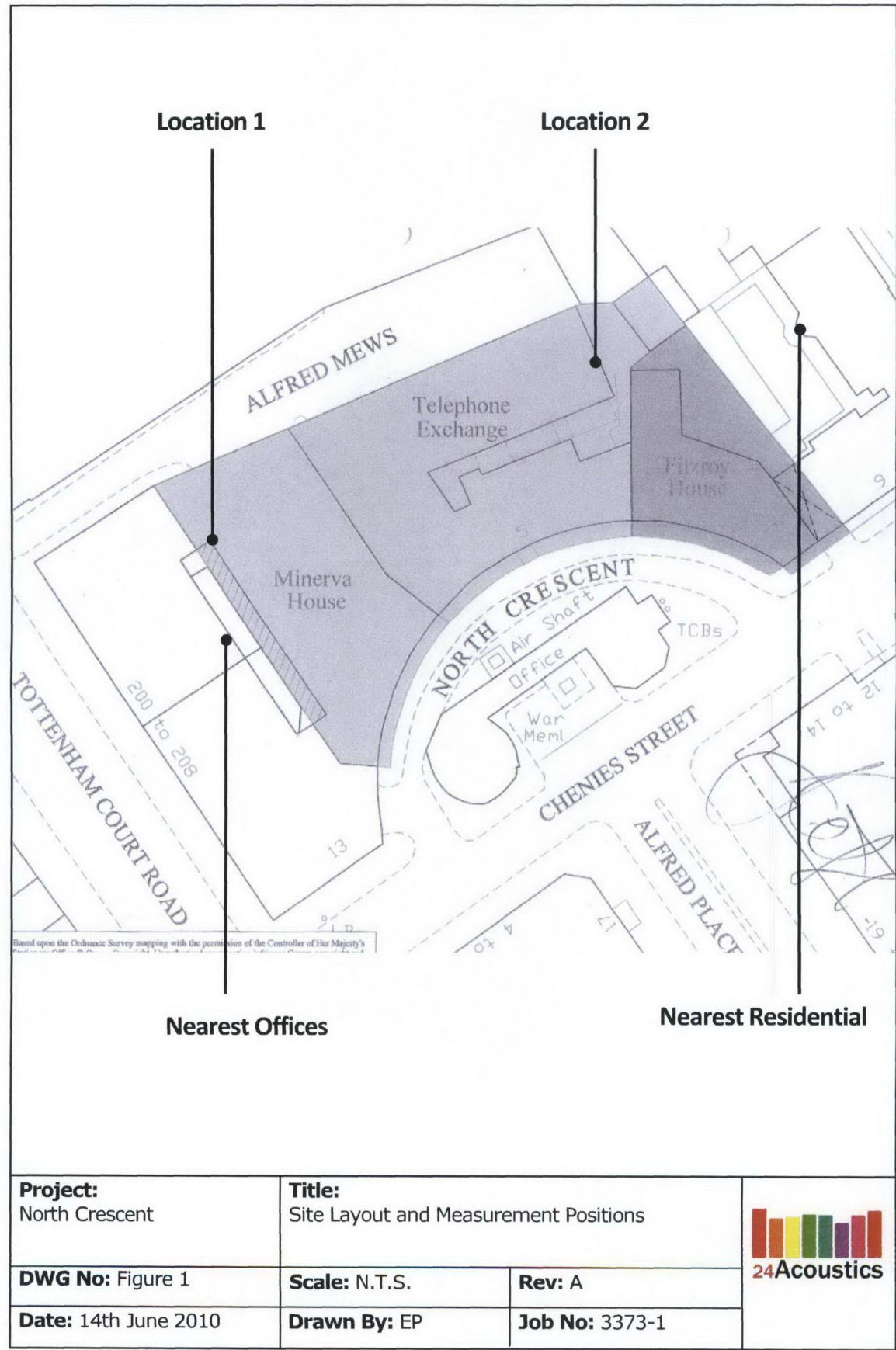
- 5.4 Much of the existing equipment is to be decommissioned. The proposal for the basement area includes a single air handling unit (55 dBA at 1m) and a single condenser unit (61 dBA at 1m). Taking into account screening to the nearest affected property, the resultant noise level from this plant would be approximately 30 dBA at the nearest affected property and hence be acceptable.
- 5.5 The proposal for the roof area includes five new air cooled condensers, (operating at 61 dBA at 1m) and an air handling unit (55 dBA at 1m). The distance to the nearest affected property (Huntley Street) is approximately 22m. The resultant noise level at the nearest property (with all plant running at maximum capacity) would be 48 dBA and hence exceed the required limit of 42 dBA.
- 5.6 It is recommended that a weatherproof screen of superficial weight not less than 12 kg/m² be installed around the proposed condenser plant (as shown in Figure 2). The panels should extend to a height of at least 0.3m above the standing height of the plant in order to achieve the target level at the nearest properties (ie, less than 42 dBA). A suitable supplier of this type of screen who has provided satisfactory systems in the past includes Noico Ltd (contact 01256 730073).
- 5.7 With the surrounding screen in place, the plant will operate within the limits identified above and hence be acceptable.

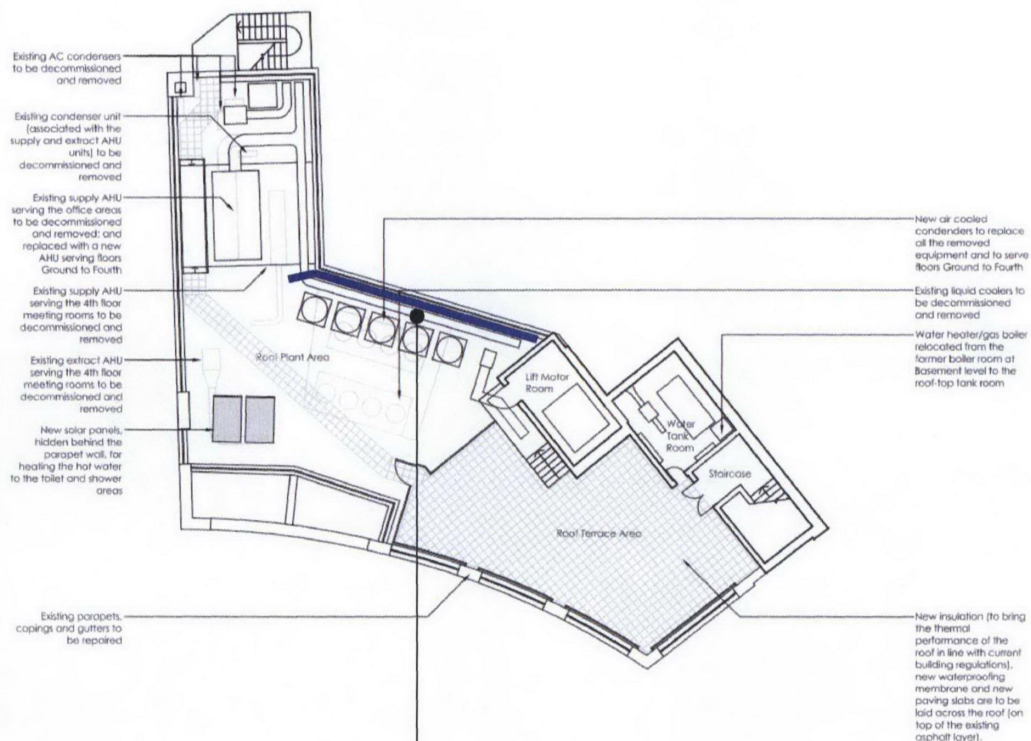
6.0 CONCLUSIONS

- 6.1 An assessment of proposed new plant has been carried out for offices at North Crescent, Chenies Street, under the requirements of the Local Planning Authority, Camden Council.
- 6.2 Based upon the background noise survey results and Local Planning Authority guidance, limiting criteria applicable to noise from the installation of external plant have been established.
- 6.3 The noise levels arising from the proposed equipment have also been reviewed and found to be acceptable with regard to the established limits.


REFERENCES

1. Department of the Environment. Planning Policy Guidance (PPG) 24, Planning and Noise, September 1994.
2. British Standards Institution. British Standard 4142. Method for Rating industrial noise affecting mixed residential and industrial areas, 1997.
3. British Standards Institution. British Standard 7445: 1991 'Description and measurement of environmental noise Part 2 - Acquisition of data pertinent to land use'.





Recommended Screen Location

Project: North Crescent	Title: Screen detail	 24Acoustics
DWG No: Figure 2	Scale: N.T.S.	
Date: 16th Sep 2010	Drawn By: SG	
	Rev: A	
	Job No: 3373-1	

APPENDIX A: ACOUSTIC TERMINOLOGY

Noise is defined as unwanted sound. The range of audible sound is from 0 to 140 dB. The frequency response of the ear is usually taken to be around 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 dBA weighting. This is an internationally accepted standard for noise measurements.

For variable sources, such as traffic, a difference of 3 dBA is just distinguishable. In addition, a doubling of traffic flow will increase the overall noise by 3 dBA. The 'loudness' of a noise is a purely subjective parameter, but it is generally accepted that an increase/ decrease of 10 dBA corresponds to a doubling/ halving in perceived loudness.

External noise levels are rarely steady, but rise and fall according to activities within an area. In 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_{Amax} noise level

This is the maximum noise level recorded over the measurement period.

ii) The L_{Aeq} noise level

This is "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 and noise from industrial premises and is the most suitable unit for the description of other forms of environmental noise. In more straightforward terms, it is a measure of energy within the varying noise.

iii) The L_{A10} 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_{A90} 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 the quieter periods. It is often referred to as the background noise level and is used in the assessment of disturbance from industrial noise.

APPENDIX B

Figure B1: Environmental Noise Survey
Minerva House 2nd - 3rd June 2010

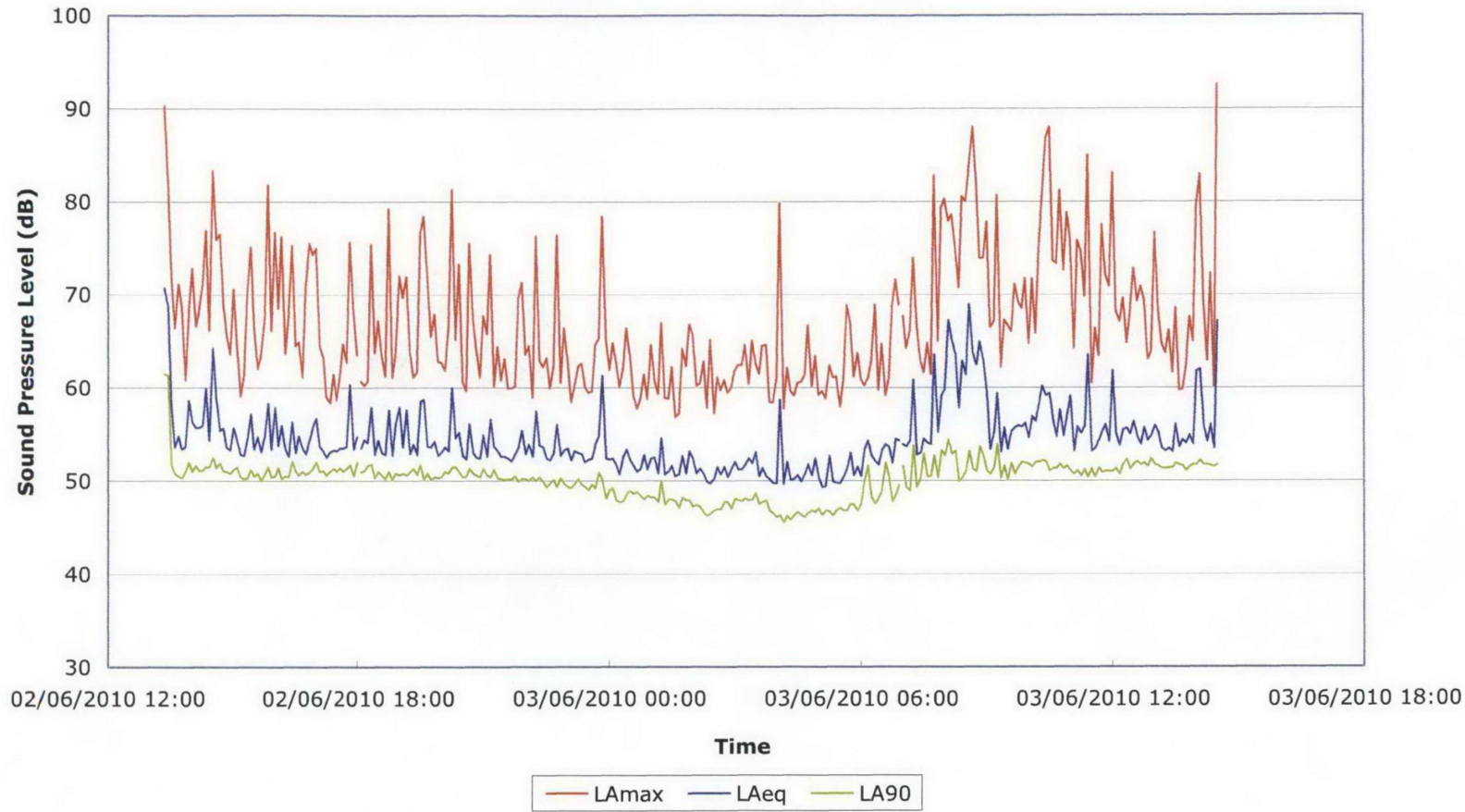


Figure B2: Environmental Noise Survey
Fitzroy House 2nd - 3rd June 2010

