paceconsult

REPORT TITLE:

Plant noise assessment report at 24 Belsize Park, NW3 4DU

CLIENT DETAILS:

Roselind Wilson Design

DATE:

18th May 2015

REPORT REFERENCE:

PC-15-0138-RP1 Rev A

PREPARED BY:

Joan-Carles Blanco BSc (Hons) MIOA

CHECKED/AUTHORISED BY:

Nick Long BA (Hons) MIOA

ANC THE ASSOCIATION OF NOISE CONSULTANTS

CHAS Accredited Contractor www.chas.gov.uk

Southern Office
652 The Crescent, Colchester
Business Park, Colchester CO4 9YQ
t: 0845 241 0142 | **f:** 0845 241 2212

Northern Office
Liverpool Science Park IC2
146 Brownlow Hill, Liverpool L3 5RF
t: 0845 872 3510 | **f:** 0845 872 3540

info@paceconsult.co.uk
www.paceconsult.co.uk

Pace Consult Ltd Registered in England and Wales Number 05733634

Contents

1. Summary

A noise assessment was commissioned by Roselind Wilson Design in support of the planning application at 24 Belsize Park NW3 4DU.

The assessment has considered the most relevant guidelines and standards, including BS 4142: 2014, *Method for Rating and assessing industrial and commercial sound,* and Local Authority Criteria. This report also includes mitigation advice in order to reduce the sound levels to levels where noise from the proposed AC condenser units is unlikely to cause complaint in accordance with Local Authority criteria.

Prepared by ……..

Joan-Carles Blanco BSc (Hons) MIOA

Acoustic Consultant

2. Introduction

2.1. Context

This report provides plant noise assessment for the proposed AC condenser units serving 24 Belsize Park NW3 4DU. Measured data is used that was obtained on site during a normal working day and compared against the calculated sound levels produced by the proposed AC condenser units.

The proposed AC condenser units consist of a Fujitsu AJY040LCLAH, and AJY045LCLAH located on the back garden.

The report has been prepared in accordance with national standards and guidelines as well as Local Authority Criteria.

This report assesses the likelihood of noise complaint from the proposed condensers to 1 metre at the façade of the nearest noise sensitive property; this is approximately 7 – 8 metres from the proposed AC condensers.

The methodology used to evaluate the likelihood of complaints is detailed within British Standard 4142: 2014, and local authority guidelines.

The following field measurements are detailed within this report:

- External ambient noise climate affected the area under study.
- Plant noise calculation for the proposed condensers.

2.2. Site description

The area immediately surrounding the site is residential. The site predominantly experiences low level of noise.

3. Criteria

3.1. Acoustic Terms and Definitions

$L_{Aeq,\ T}$ - The A-weighted equivalent continuous sound pressure level. A representation of a continuous sound level containing the same amount of sound energy as the measured varying noise over the measurement period, t.

$L_{A90,\ T}$ - The A-weighted sound pressure level that is exceeded for 90% of the measurement period, t. This is commonly used as the 'Background Noise Level' for assessing the effects of industrial noise in the UK.

L_{Amax} - The highest A-weighted noise level recorded during a noise measurement period.

3.2. Assessment Methodology

BS4142 has recently been revised and the 1997 edition has been replaced. The standard sets out a methodology for the assessment of whether noise from factories, industrial premises or fixed installations and sources of an industrial/commercial nature.

The procedure contained in BS4142 for assessing the likelihood of complaints is to compare the measured or predicted noise level from the source in question, the 'specific noise level', at the assessment position with the correct background noise level for the worst case time of operation.

Where the noise contains a 'distinguishable, discreet, continuous note (whine, hiss, screech, hum etc.) or if there are distinct impulses in the noise (bangs, clicks or clatters), or if the noise is irregular enough to attract attention' then a range of correction factors can be added to the specific noise level as appropriate to obtain the 'rating level'.

As this is a prescriptive report prior to plant installation, overall rating noise levels will be specified for the new installation. Compliance with the rating value will be necessary to provide evidence that significant adverse impact has been avoided as required by the NPSE.

To assess the likelihood of complaints, the measured background noise level is subtracted from the rating noise level. BS4142 states:

The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs. An effective assessment cannot be conducted without an

understanding of the reason(s) for the assessment and the context in which the sound occurs/will occur. When making assessment and arriving at decisions, therefore, it is essential to place the sound in context.

Obtain an initial estimate of the impact of the specific sound by subtracting the measured background sound level (See Clause 8) from the rating level (see Clause 9) and consider the following.

a) *Typically the greater the difference, the greater the magnitude of the impact.*

b) *A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context.*

c) *A difference of around 5dB is likely to be an indication of an adverse impact, depending on the context.*

d) *The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.*

Where the initial estimate of the impact needs to be modified due to the context, take all pertinent factors into consideration, including the following.

1) *The absolute level of sound. For a given difference between the rating level and the background sound level, the magnitude of the overall impact might be greater for an acoustic environment where the residual sound level is high than for an acoustic environment where the residual sound level is low.*

   Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night.

   Where residual sound levels are very high, the residual sound might itself result in adverse impacts or significant adverse impacts, and the margin by which the rating level exceeds the background might simply be an indication of the extent to which the specific sound source is likely to make those impacts worse.

2) *The character and level of the residual sound compared to the character and level of the specific sound. Consider whether it would be beneficial to compare the frequency spectrum and temporal variation of the specific sound with that of the ambient or residual sound, to assess the degree to which the specific sound source is likely to be distinguishable and will represent an incongruous sound by comparison to the acoustic environment that would occur in the absence of the specific sound. Any sound parameters, sampling periods and averaging time periods used to undertake character comparisons should reflect the way in which sound of an industrial and/or commercial nature is likely to be perceived and how people react to it.*

3) *The sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions, such as;*

   i) Façade sound insulation treatment

   ii) Ventilation and/or cooling that will reduce the need to have windows open so as to provide rapid or purge ventilation; and

   iii) Acoustic screening.

In summary, the BS4142: 2014, 'Methods for rating and assessing industrial and commercial sound' would indicate that compliance with the wider aims of the NPSE is achieved when a rating level does not exceed the background sound level for the given time of operation.

3.3 Camden Development Policies 2010-2015. Local Development Framework.

Camden Development Policies forms part of the Council's Local Development Framework (LDF), the group of documents setting out our planning strategy and policies. The lead Local Development Framework document is the Core Strategy, which sets out the key elements of the Council's planning vision and strategy for the borough and contains strategic policies.

Table E of this document includes the minimum noise levels from mechanical plant at which the planning application will be refused. Table E is included below.

Table E: Noise levels from plant and machinery at which planning permission will not be granted

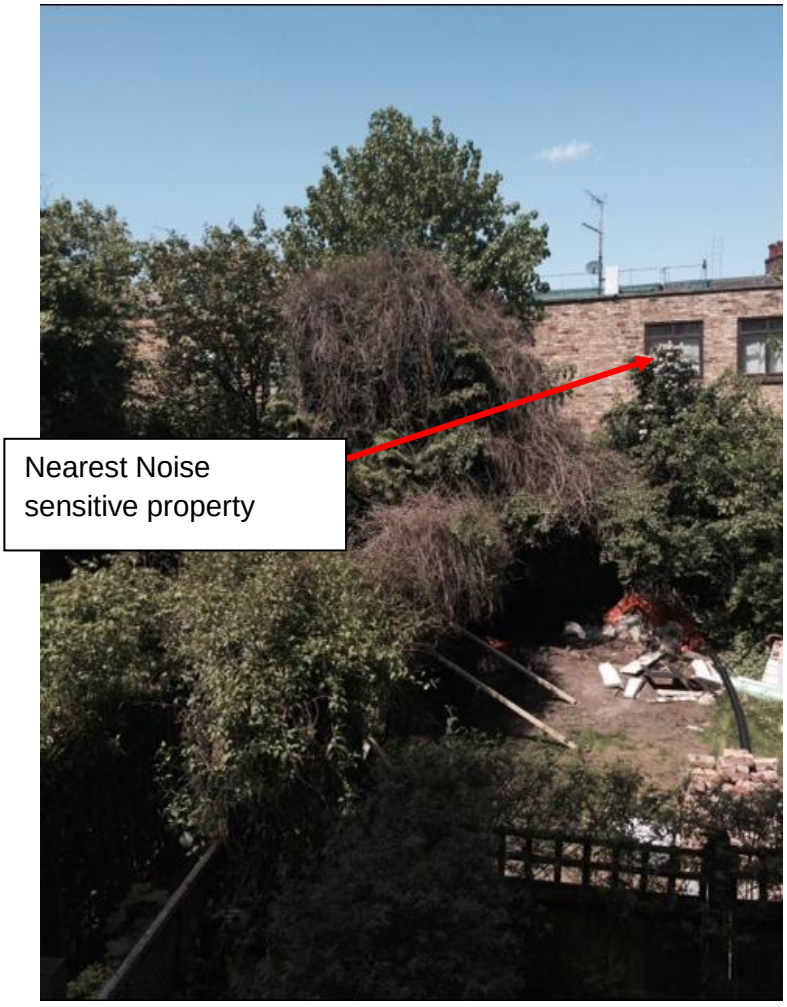
Noise description and location of measurement	Period	Time	Noise level
Noise at 1 metre external to a sensitive façade	Day, evening and night	0000-2400	5dB(A) <LA90
Noise that has a distinguishable discrete continuous note (whine, hiss, screech, hum) at 1 metre external to a sensitive façade.	Day, evening and night	0000-2400	10dB(A) <LA90
Noise that has distinct impulses (bangs, clicks, clatters, thumps) at 1 metre external to a sensitive façade.	Day, evening and night	0000-2400	10dB(A) <LA90
Noise at 1 metre external to sensitive façade where LA90>60dB	Day, evening and night	0000-2400	55dBL_{Aeq},

4. Noise survey and condensers noise assessment

4.1. Baseline noise level survey details

Noise measurements were undertaken in free-field conditions on Tuesday 12th and Wednesday 13th May 2015. The sound level meter for the twenty four hours noise survey was positioned at 24th Belsize Park, NW3 4DU back garden. The sound level meter was positioned 1.5 metres above roof level and 3 metres from any reflective surface. This location is representative of the ambient sound levels affecting the nearest noise sensitive property.

The nearest noise sensitive property affected by the proposed condensers is the number 53 Belsize Ln.



The photograph above shows the nearest noise sensitive property.

The survey location is shown below.

Weather conditions for the duration of the measurement period were generally clear and mild with very light winds (< 2m/s). There were no occasions of rain and, consequently, conditions were considered conducive to environmental noise measurement.

All measurements were made with a calibrated precision grade sound level meter (Svantek Serial number 34937) which achieves the requirements of BS EN 61672: 2003. The Sound Level Meter was calibrated before and after our environmental noise survey using Norsonic NOR-1251 calibrator, no significant drift was observed between readings.

The survey was carried out in accordance with the principles of BS7445: 2003: Parts 1, Description and measurement of environmental noise, and BS4142: 2014.

Table below includes the L_{Aeq}, 15 min dB, $L_{Amax,fast}$, and the L_{A90}, 15 min dB.

Table 1 : 24 hours Noise measurements dBA			
	LAeqLog average	LAmax,fast 95th Percentile	LA90 15min
Day (07:00-23:00)	50	72	37
Night (23:00-07:00)	49	70	31

The figure below shows the levels summary during the measurement period

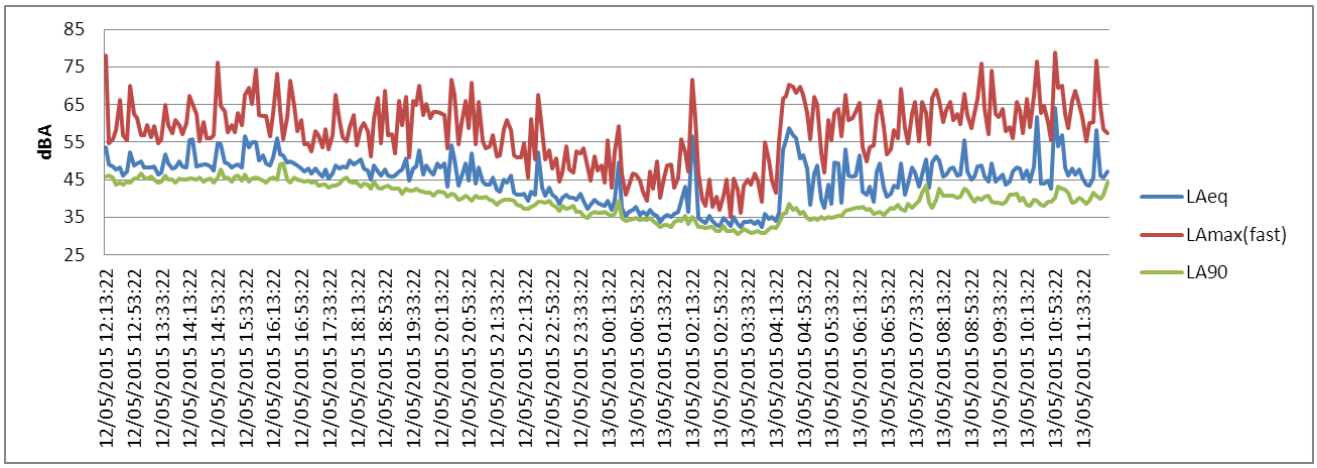


Figure 1. Summary of the measurement period.

4.2. Proposed condensers outdoor sound levels calculation

The predicted sound levels from the proposed condensers at the nearest residential properties has been evaluated using Part 2 of ISO 9613 Acoustics -- Attenuation of sound during propagation outdoors -- Part 2: General method of calculation. The ISO standards used within the calculations are incorporated with SoundPLAN v 7.2 outdoor sound prediction software. This software was used to generate outdoor sound levels from the proposed generator to the nearest receptor and to produce noise contour maps.

The sound levels of the proposed condensers are extracted from manufacturer information and they are shown in the table below.

Table 2 : Condensers sound pressure level dBA

Unit	dBA
Fujitsu AJY040LCLAH	54
Fujitsu AJY045LCLAH	55

The calculation takes in consideration the worst case scenario, the two condensers running constantly during night period. The figure below shows the location of the two condensers and the nearest noise sensitive residential.

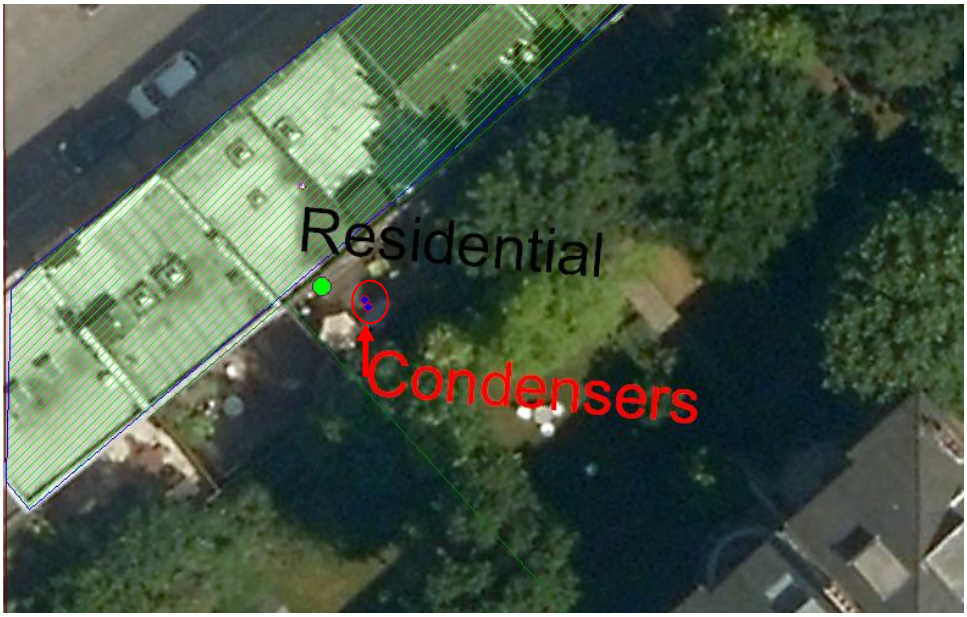


Figure 2. Residential and Condenser locations used in the calculation.

The calculated noise emission from the condensers at 1 metre from the façade to the nearest noise sensitive façade is shown below.

Table 3 : Condensers sound pressure level dBA	
	dBA
1 metre from external façade	36

4.3. Baseline noise level survey results

The result of the lowest background noise measurement is presented in Table 4 below.

Table 4 : Lowest measured LA90, 5 min dB levels during Survey
LA90,15min dB
31

Subjectively, the site experiences noise predominantly from the existing transportation network and other urban and natural noise sources.

5. Local Authority Assessment.

Using the assessment criteria described above, the following assessment has been conducted.

Table 5 : Assessment at 1 metre external to a sensitive facade		
Specific Noise Level (Calculated)	Background Level (L_{A90})	against background noise level
36	31	+5

The local authority criteria recommend that the noise emission from the condensers should be 10 dB below the lowest measured background. The table above shows that the calculated noise emission from the condensers is 5 dB above the lowest measured background levels. Therefore, an enclosure with a minimum sound reduction of 15 dB should be installed on site.

It is understood that an enclosure has already been selected from louvrenax with a sound reduction in excess of the 15 dB required in order to meet the local authority criteria. The selected enclosure is shown below.

CUSTOMER:	SITE / LOCATION / REFERENCE
ACE Air Conditioning	Belsize Park Project

ORIGINAL EQUIPMENT MANUFACTURERS PUBLISHED DATA

MAKE, MODEL, DIMENSIONS, AIR FLOW & SOUND PRESSURE LEVEL @1.0M FREE FIELD

MAKE	MODEL			AIR IN	AIR OUT
Fujitsu	See Notes			H - R & 1 Side	H - Front
WIDTH (MM)	DEPTH (MM)	HEIGHT (MM)	AIRFLOW (M^3S^{-1})	DISTANCE (M)	SPL dB(A)
970 + 970	370	998	2.41	1	58

INNER CUBE DIMENSION		
2730	1100	1310
WIDTH (MM)	DEPTH (MM)	HEIGHT (MM)
2.41	1.0	58
AIRFLOW (M^3S^{-1})	DISTANCE (M)	SPL dB(A)

ENCLOSURE DETAIL		
2780	1150	1375
WIDTH (MM)	DEPTH (MM)	HEIGHT (MM)
2.4	1.0	40
AIRFLOW (M^3S^{-1})	DISTANCE (M)	SPL dB(A)

INLET AIRWAYS		
525	25	52
WIDTH (MM)	HEIGHT (MM)	NO.

DESIGN CRITERIA		
OK	OK	OK
UNIT SIZE	OUTLET	INLET

OUTLET AIRWAYS		
1200	25	26
WIDTH (MM)	HEIGHT (MM)	NO.

AIRFLOW INFORMATION		
15	3.1	3.5
PD (NM^{-2})	OUTLET (MS^{-1})	INLET (MS^{-1})

Select Inlet & Outlet Duct Sizes to Ensure Airflows are kept Below 6.0m/s

QUOTE INFORMATION	WIDTH (MM)	DEPTH (MM)	HEIGHT (MM)
INLET AIRWAY			
OUTLET AIRWAY			
EXTERNAL SIZE	2780	1150	1375
INDICATIVE NOISE LEVEL @ 1 M (FREE FIELD)**	40	SPL dB(A) SOUND PRESSURE	

6. Conclusions

A noise assessment was commissioned by Roselind Wilson Design in support of the planning application at 24 Belsize Park, NW3 4DU

The assessment has shown that the noise emission from the condensers without acoustic treatment is above the limiting criteria imposed by the local authority. The selected enclosure will reduce the noise emission from the condensers up to more than 15 dB below the lowest measured background at 1 metre from the façade of the nearest residential property.