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**48 CHURCHWAY,
EUSTON,
LONDON NW1 1LJ**

**PLANT NOISE CRITERIA
PLANNING SUPPORT REPORT**

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1.0 Introduction

- 1.1 The purpose of this report is to set noise emission criteria for the proposed mechanical services plant serving the part new/part refurbished office building at 48 Churchway, Euston, London, NW1, in relation to the prevailing planning policy requirements stipulated by London Borough of Camden.
- 1.2 An environmental noise level survey has been completed to establish the noise climate at and around the site, and the results of the survey are used to develop the relevant criteria.

2.0 Site Description

- 2.1 The site is located between Churchway and Charlton street, and is surrounded by a mixture of commercial and residential buildings. The development proposal amounts to the refurbishment of an existing commercial building, with the addition of further floors on the side of the site facing onto Churchway. The proposal will include a new building services plant scheme which has yet to be fully designed.
- 2.2 The site is bound by Churchway to the west and Chalton Street to the east. The nearest noise sensitive buildings have been identified as residential properties on Churchway, directly adjacent to the development site. Refer to Appendix 1 for a site plan.

3.0 Noise Survey Details

- 3.1 Instrumentation: Larson Davis type 820 Type 1 sound level meter (Serial No. 0719) with associated pre-amplifier and microphone. This instrument was powered by an external battery and stored in a weather proof case. The instrument was checked for calibration prior and subsequent to use with a Larson Davis type CA 250 calibrator whereupon no calibration drift was recorded. The instrument was used in accordance with manufacturer's instructions.
- 3.2 Location: The noise monitor microphone was located at a position to record representative noise levels at and around the nearest noise sensitive receivers, which are currently residential properties to the north and south of the site. Access to the roof of the building was restricted, so the noise monitor was placed on the roof of a nearby four storey office block, (see appendix 1). This location is considered to offer an appropriate surrogate location with regard to prevailing noise levels arising at the nearest residential properties.
- 3.3 Periods: Noise level monitoring was continuous from approximately 13:45 hours on Thursday 19th April 2018 until approximately 16:00 hours Monday 23rd April 2018. The sound level meter was configured to monitor noise levels continuously in fifteen minute intervals.
- 3.4 Weather: The weather conditions prevailing during the survey period were generally overcast and dry; although some rain did occur infrequently over the survey period it is considered to have a negligible influence on the overall noise climate. Wind speed, although not recorded, was considered to be less than 5 m/s throughout the survey period, based upon the prevailing weather conditions.

- 3.5 **Site Noise Characteristics:** The prevailing background noise levels were noted to be controlled by noise from road traffic on Chalton Street and Churchway, located to the east and west respectively. There is also a noise contribution from pedestrian activities and various existing items of nearby and distant building services plant. It is considered that no unusual events occurred during the survey period, and the data includes a fair representation of the noise levels in the area.
- 3.6 **Surveyor:** Alec Higgins AMIOA
- 3.7 **Results:** The results of the measurements are presented below showing the recorded values of the lowest typical background noise level (L_{A90} dB). Refer to Appendix 1 for the measurement location and Appendix 2 for the measurement data in graph form.

Table 1: Lowest Background Noise Level Measurements $L_{A90,T}$ dB

Date	Daytime L_{A90} (15min) (07:00-23:00)	Night-time L_{A90} (15min) (23:00-07:00)
19/04/2018 to 20/04/2018	49 dB*	45 dB
20/04/2018 to 21/04/2018	49 dB	44 dB
21/04/2018 to 22/04/2018	47 dB	45 dB
22/04/2018 to 23/04/2018	47 dB	45 dB
23/04/2018	49 dB*	-
Overall Lowest Background Noise Level	49 dB	45 dB

*Partial measurement

4.0 Planning Requirements

- 4.1 In permitting (re)development including new plant, London Borough of Camden (LBC) generally impose a planning condition in respect of limiting noise from plant and equipment affecting noise sensitive properties. Details of the relevant policy to be adopted when determining this condition are set out in the Local Plan Adoption Version Appendix 3: Noise Threshold, which states the following:

Industrial and Commercial Noise Sources

A relevant standard or guidance document should be referenced when determining values for LOAEL and SOAEL for non-anonymous noise. Where appropriate and within the scope of the document it is expected that British Standard 4142:2014 'Methods for rating and assessing industrial and commercial sound' (BS 4142) will be used. For such cases a 'Rating Level' of 10 dB below background (15dB if tonal components are present) should be considered as the design criterion).

Table C: Noise levels applicable to proposed industrial and commercial developments (including plant and machinery)

Existing Noise Sensitive Receptor	Assessment Location	Design Period	LOAEL (Green)	LOAEL to SOAEL (Amber)	SOAL (Red)
Dwellings**	Garden used for main amenity (free field) and Outside living or dining or bedroom window (façade)	Day	'Rating level' 10dB* below background	'Rating level' between 9dB below and 5 dB above background	'Rating level' greater than 5 dB above background
Dwellings**	Outside bedroom window (façade)	Night	'Rating level' 10dB* below background and no events exceeding 57 dB L _{AMax}	'Rating level' between 9dB below and 5 dB above background or noise events between 57dB and 88dB L _{AMax}	'Rating level' greater than 5dB above background and/or events exceeding 88dB L _{AMax}

*10dB should be increased to 15dB if the noise contains audible tonal elements. (day and night). However, if it can be demonstrated that there is no significant difference in the character of the residual background noise and the specific noise from the proposed development then this reduction may not be required. In addition, a frequency analysis (to include, the use of Noise Rating (NR) curves or other criteria curves) for the assessment of tonal or low frequency noise may be required.

** levels given are for dwellings, however, levels are use specific and different levels will apply dependent on the use of the premises.

The periods in Table C correspond to 0700 hours to 2300 hours for the day and 2300 hours to 0700 hours for the night. The Council will take into account the likely times of occupation for types of development and will be amended according to the times of operation of the establishment under consideration.

- 4.2 It is understood that all proposed mechanical services plant could potentially operate 24-hours a day, seven days a week.
- 4.3 Based on the measured background noise levels established in Table 1, in order to be compliant with the London Borough of Camden policy, which states "For such cases a 'Rating Level' of 10 dB below background (15dB if tonal components are present) should be considered as the design criterion)", the proposed mechanical services plant should not exceed the noise limit in the table below:

Table 2: Maximum Proposed Permissible Noise Criteria applicable at the Nearest Noise Sensitive Receiver

Period	Maximum Noise Limit	Maximum Noise Limit (if the plant has a distinguishable discrete continuous note)
Daytime (07:00 – 23:00)	39 dB L _{Aeq}	34 dB L _{Aeq}
Night-time (23:00 – 07:00)	35 dB L _{Aeq}	30 dB L _{Aeq}

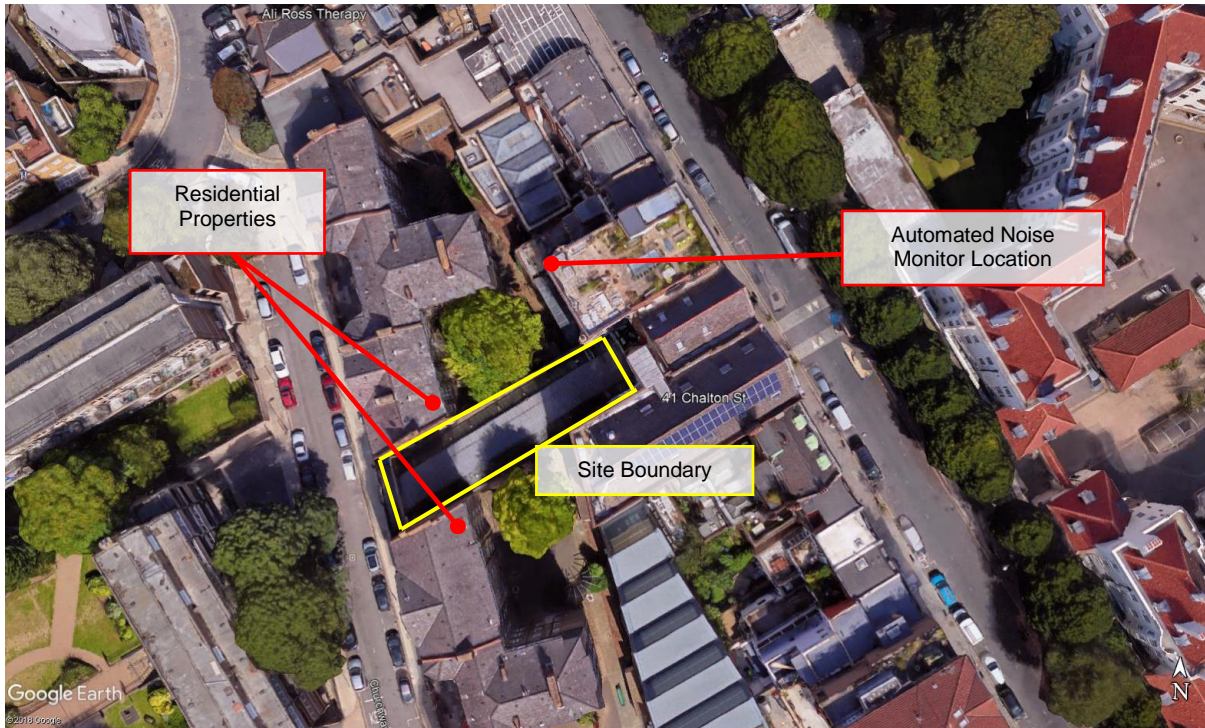
5.0 Plant Noise Assessment

- 5.1 A Plant Noise Assessment will need to be undertaken once details and location of the building services plant scheme are finalised. The Plant Noise Assessment will aim to demonstrate that the proposed building services plant scheme - including any noise control requirements - complies with the expectations of Policy A4 and supporting Appendix 3 of the Camden Local Plan (2017).

6.0 Conclusion

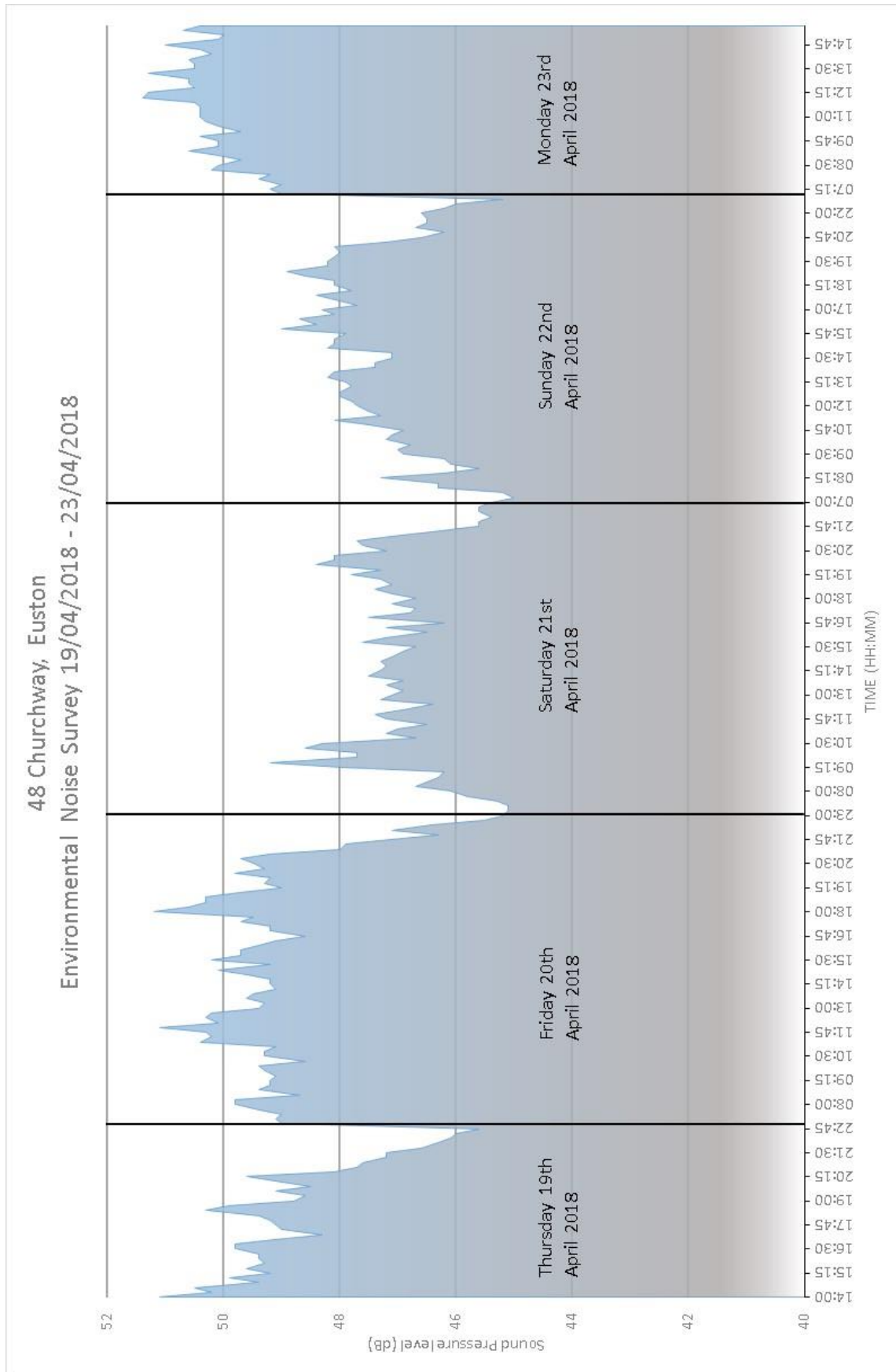
- 6.1 A noise survey at 48 Churchway, Euston, London, NW1 has been undertaken to establish prevailing levels of background noise.
- 6.2 Noise level limits for any future building services plant scheme associated with the development proposal, have been derived from the planning policy requirements stipulated by London Borough of Camden.
- 6.3 Appropriate allowances for noise control will need to be included in the design and installation of the proposed building services plant to achieve these criteria. A full plant noise assessment may need to be undertaken in order to discharge any planning conditions imposed, once the scheme has been suitably developed.

Appendix 1: Current Site Plan and Measurement Location



Source: Google Earth

Appendix 2: Noise Survey Data



Appendix 3: Glossary of Terms

Term	Description	Explanation
	Noise	Unwanted sound. In the explanation given below the words 'sound' and 'noise' can often be used interchangeably, depending on context.
dB	The decibel scale	The decibel (or dB) scale is the scale on which sound pressure levels are commonly measured. It is a logarithmic scale and is used for convenience to compress the audible range of sound pressures into a manageable range, from 0 dB to 140 dB. The zero of the scale, 0 dB, corresponds to the threshold of hearing, 0.00002 Pa, and the upper limit, 140 dB, corresponds to 20 Pa, the threshold of pain.
	Sound pressure	Sound is a disturbance or fluctuation in air pressure, and sound pressure, measured in pascals (Pa), is used as a measure of the magnitude of the sound. The human ear can detect sound pressures in the range from 0.00002 Pa to 20 Pa. This is an enormously wide range and so for convenience sound pressures are commonly measured on a decibel (dB) scale.
Lp	Sound pressure level	Instantaneous value of Sound Pressure Level (Lp).
	Sound power	The sound energy radiated per unit time by a sound source, measured in watts (W)
L _w	Sound power level	Sound power measured on a decibel scale: $L_w = 10\log(W/W_0)$, where W_0 is the reference value of sound power, 10^{-12} W.
f	Frequency	The frequency of a musical note is what gives it its pitch. It is the number of cycles of the fluctuating sound pressure which occur each second, and is measured in cycles per second, or Hertz (Hz). The human ear can detect frequencies in the range 20 to 20 000 Hz. Most sounds and noises are a mixture of all frequencies, called broad-band noise.
	Octave bands Octave band spectra	In order investigate the frequency content of broad band sounds, called its frequency spectrum, measurements of sound pressure are carried out over a range of frequency bands. The most common method is to split the audio frequency range into 8 or 9 octave bands. An octave is a frequency range from one particular frequency to double that frequency.
	Free-field	A free field sound level measurement is one which is unaffected by the presence of any sound reflecting surfaces. In an outdoor situation this is usually taken to mean with no sound reflecting surfaces within 3 m. of the source.
	Facade correction Factor	The difference between the façade level and the free field level (in the absence of the façade) is called the façade correction factor.
A	A-weighting	One of the three frequency weightings (A, C and Z) used in sound level meters, and defined in BS EN ISO 61672-1; a very widely used method of producing a single figure measure of a broad band noise which takes into account, in an approximate way at least, the frequency response of the human hearing system. The idea is that sound levels measured in this way should give an indication of the loudness of the sound.
f	Time weighting, fast	An averaging time used in sound level meters, and defined in BS EN ISO 61672-1.
L _A (dBA)	A- weighted sound pressure level	The value of the sound pressure level, in decibels, measured using an A-weighting electronic circuit built into the sound level meter. The vast majority of noise measurements are carried out in this way.

$L_{Aeq,T}$	Equivalent continuous sound level	It represents a measure of the 'average' sound level over the measurement period. It corresponds to the steady level of sound which, over the same period of time, T, would contain the same amount of (A-weighted) sound energy as the time varying noise. Also known as the Average sound level. This is the most common method of measuring time varying noise, and within certain limits gives the best correlation with human response to noise, for example with annoyance.
$L_{AN,T}$	Statistical percentile noise levels	$L_{AN,T}$ is the noise level, usually A-weighted, which is exceeded for N% of the measurement period, T. The most commonly used values are $L_{A10,T}$ used for the measurement and assessment of traffic noise, and $L_{A90,T}$, commonly used as a measure of background noise. $L_{A1,T}$ and $L_{A99,T}$ are also occasionally used to give an indication of the highest and lowest noise levels occurring during the measurement time interval.
$L_{Amax,T}$	Maximum sound pressure level	The instantaneous maximum sound pressure level, usually A-weighted, which occurred during the measurement period, T. It is commonly used to measure the effect of very short duration bursts of noise, such as for example sudden bangs, shouts, car horns, emergency sirens etc. which audibly stand out from the general level of, say, traffic noise, but because of their very short duration, maybe only a very small fraction of a second, may not have any effect on the $L_{Aeq,T}$ value. The time weighting, F or S, must always be specified.
	Background noise	Ambient noise which remains at a given site when occasional and transient bursts of higher level ambient noise levels have subsided to typically low levels; it is the noise normally present for most of the time at a given site. It is usually described by the L_{A90} value.
$L_{A90,T}$	Background noise level	Defined in BS 4142 as the value of the A-weighted residual noise at the assessment position that is exceeded for 90 % of a given time interval, T, (i.e. $L_{A90,T}$) measured using time weighting, F, and quoted to the nearest whole number of decibels. (Also see under residual noise). Background noise itself often varies with time and so the $L_{A90,T}$ is almost universally used as the best measure of the 'more or less always present' noise level which underlies short term variations from other sources of noise.
	Specific Noise Source	The noise source under consideration when assessing the likelihood of adverse impact using BS4142:2014.
	Specific Noise Level	The value of $L_{Aeq,T}$ at the assessment position produced by the specific noise source, ref. BS4142:2014.
$L_{ar,Tr}$	Rating Level	The specific noise level, corrected to account for any characteristic features of the noise, by adding a rating penalty for any tonal, impulsive or irregular qualities, ref. BS4142:2014.
T_r	Reference time interval	Specified interval over which the specific sound level is determined, ref. BS4142:2014.
	Residual Sound	Ambient sound remaining at the assessment location when the specific sound source is suppressed to such a degree that it does not contribute to the ambient sound, ref. BS4142:2014.
$L_r = L_{Aeq,T}$	Residual Sound Level	Equivalent continuous A-weighted sound pressure level of the residual sound at the assessment location over a given time interval, T, ref. BS4142:2014.