

# Network Building London

## Plant Noise Assessment Outline Application Document

27891/PNA1/OA.Rev1

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For:  
Derwent Valley Property Developments Limited





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### Document Control

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0	19/11/2020	First Issue Outline Application Document		
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## **Plant Noise Assessment Outline Application Document 27891/PNA1**

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### **Attachments**

Appendix A – Acoustic Terminology



## 1.0 Introduction

This proposal seeks outline planning permission for “Demolition of the existing building and construction of a new building to provide for a maximum of 17275 sqm (GIA) of E class use floorspace along with details of access, scale and landscaping and other works incidental to the application (layout and appearance reserved).

Items of external building services plant are also proposed to be installed on the roof areas.

Hann Tucker Associates have therefore been commissioned to undertake a plant noise assessment based on the environmental noise survey data (ref. 27891/ADS1 dated 3 August 2020).

This outline application document details relevant Local Authority policy and requirements and sets plant noise emission criteria to achieve at the nearest residential windows. Assessments of the proposed plant noise emissions is to be detailed in subsequent reserved matters documents.

## 2.0 Objectives

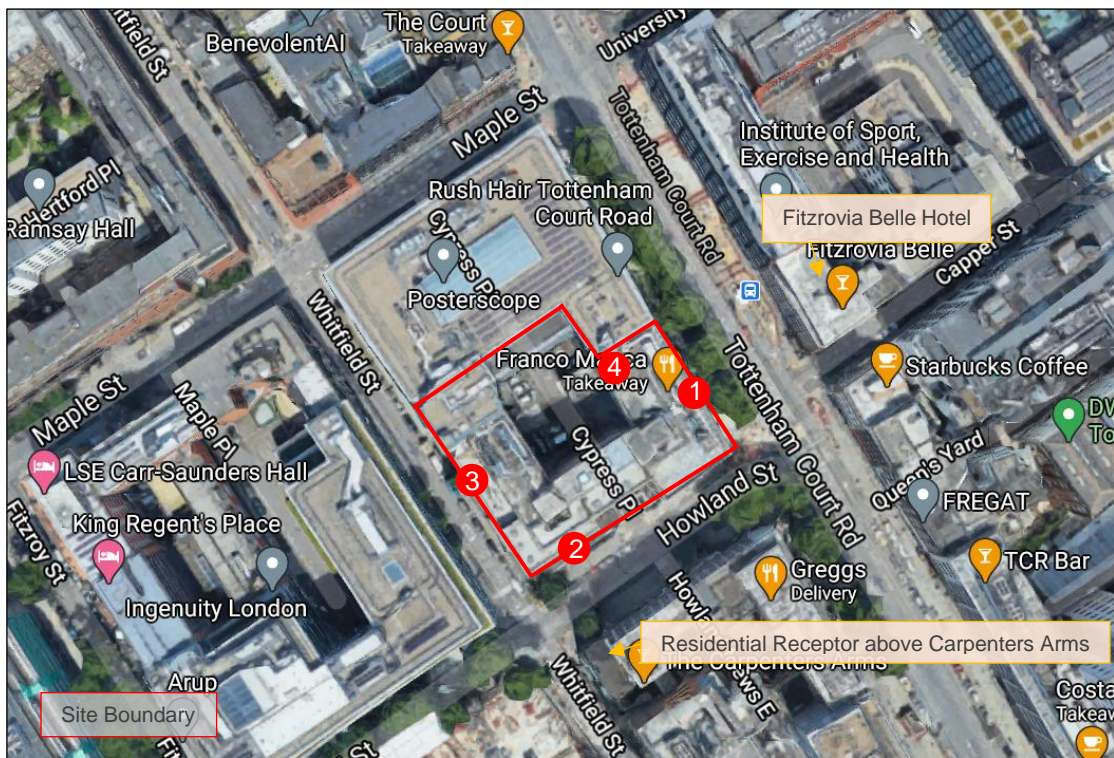
To review data from a previous environmental noise survey to identify noise emission limits from the development with reference to the requirements of the Local Authority and/or the application of BS4142: 2014 and to minimise the possibility of noise nuisance to neighbours.

To advise on noise control measures if required with reference to the requirements of the Local Authority.

## 3.0 Site Description

### 3.1 Location

The site is located at the Network Building, Tottenham Court Road and falls within the jurisdiction of the London Borough of Camden Council. See location map overleaf with neighbouring properties annotated.



Site plan (Google © 2020)

## 4.0 Acoustic Terminology

For an explanation of the acoustic terminology used in this report please refer to Appendix A enclosed.

## 5.0 Acoustic Standards and Guidelines

### 5.1 Noise Policy Statement for England

The Noise Policy Statement for England (NPSE) was published in March 2010 (i.e. before the NPPF). The NPSE is the overarching statement of noise policy for England and applies to all forms of noise other than occupational noise, setting out the long term vision of Government noise policy which is to:

*“Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.”*

*“Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:*

- *avoid significant adverse impacts on health and quality of life;*



- *mitigate and minimise adverse impacts on health and quality of life; and*
- *where possible, contribute to the improvement of health and quality of life.”*

The Explanatory Note to the NPSE has three concepts for the assessment of noise in this country:

#### **NOEL – No Observed Effect Level**

This is the level below which no effect can be detected and below which there is no detectable effect on health and quality of life due to noise.

#### **LOAEL – Lowest Observable Adverse Effect Level**

This is the level above which adverse effects on health and quality of life can be detected.

#### **SOAEL – Significant Observed Adverse Effect Level**

This is the level above which significant adverse effects on health and quality of life occur.

None of these three levels are defined numerically and for the SOAEL the NPSE makes it clear that the noise level is likely to vary depending upon the noise source, the receptor and the time of day/day of the week, etc. The need for more research to investigate what may represent an SOAEL for noise is acknowledged in the NPSE and the NPSE asserts that not stating specific SOAEL levels provides policy flexibility in the period until there is further evidence and guidance.

The NPSE concludes by explaining in a little more detail how the LOAEL and SOAEL relate to the three NPSE noise policy aims listed above. It starts with the aim of avoiding significant adverse effects on health and quality of life, then addresses the situation where the noise impact falls between the LOAEL and the SOAEL when *“all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also taking into account the guiding principles of sustainable development.”* The final aim envisages pro-active management of noise to improve health and quality of life, again taking into account the guiding principles of sustainable development which include the need to minimise travel distance between housing and employment uses in an area.

## **5.2 National Planning Policy Framework (NPPF)**

The following paragraphs are from the NPPF (revised February 2019):

*“180. Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on*



*health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:*

*a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;*

*b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.*

*182. Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or ‘agent of change’) should be required to provide suitable mitigation before the development has been completed.”*

Paragraph 180 also references the Noise Policy Statement for England. This document does not refer to specific noise levels but instead sets out three aims:

“Avoid significant adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.

Mitigate and minimise adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.

Where possible, contribute to the improvement of health and quality of life through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.”

### **5.3 Planning Practice Guidance on Noise**

Planning Practice Guidance (PPG) under the NPPF has been published by the Government as a web based resource at <http://planningguidance.planningportal.gov.uk/blog/guidance/>. This includes specific guidance on Noise although, like the NPPF and NPSE the PPG does not provide any quantitative advice. It seeks to illustrate a range of effect levels in terms of



examples of outcomes as set out in the following table:

Perception	Examples of Outcomes	Increasing effect level	Action
Not noticeable	No effect	No Observed Effect	No specific measures required
Noticeable and not intrusive	Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No specific measures required
		Lowest Observed Adverse Effect Level	
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance.	Observed Adverse Effect	Mitigate and reduce to a minimum
		Significant Observed Adverse Effect Level	
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable hard, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

## 5.4 Local Authority Requirements

Building services plant external noise emission levels will need to comply with Local Authority requirements and statutory noise nuisance legislation.

We understand that the requirements of the London Borough of Camden are as follows:

*Note: NOAL – No Observed Effect Level, LOAEL- Lowest Observed Adverse Effect Level, SOAEL – Significant Observed Adverse Effect Level.*





*“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).*

<b>Table C: Noise levels applicable to proposed industrial and commercial developments (including plant and machinery)</b>					
<b>Existing Noise Sensitive Receptor</b>	<b>Assessment Location</b>	<b>Design Period</b>	<b>LOAEL (Green)</b>	<b>LOAEL to SOAEL (Amber)</b>	<b>SOAL (Red)</b>
Dwellings**	Garden used for main amenity (free field) and Outside living or dining window (façade)	Day	‘Rating level’ 10dB below background	‘Rating level’ 9dB below and 5dB above background	‘Rating level’ greater than 5dB above background
Dwellings **		Night	‘Rating level’ 10dB below background and no events exceeding 57dBL <sub>Amax</sub>	‘Rating level’ 9dB below and 5dB above background or noise events between 57dB and 88dBL <sub>Amax</sub>	‘Rating level’ greater than 5dB above background and/or events exceeding 88dBL <sub>Amax</sub>

*\*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 are given for dwellings, however, levels are use specific and different levels will apply dependant on the use of premises”*

## **5.5 BS 4142:2014**

When setting plant noise emission criteria reference is commonly made to BS 4142: 2014 “Methods for rating and assessing industrial and commercial sound”.

The procedure contained in BS 4142:2014 provides an assessment of the likely effects of sound



on people when comparing the specific noise levels from the source with representative background noise levels. Where the noise contains “a tone, impulse or other characteristic” then various corrections can be added to the specific (source) noise level to obtain the “rating level”.

BS 4142 states that: *“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 estimation of the impact of the specific noise can be obtained by the difference of the rating noise level and the background noise level and considering the following:*

- *“Typically, the greater this difference, the greater the magnitude of the impact.”*
- *“A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context.”*
- *“A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context.”*
- *“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.”*

The determination of the “rating level” and the “background level” are both open to interpretation, depending on the context.

In summary it is not possible to set plant noise emission criteria purely on the basis of BS 4142:2014. It is reasonable to infer from the above, however, that a difference of around -5dB corresponds to “No Observed Effect Level” as defined in the Noise Policy Statement for England. It is also reasonable to infer from the above that if the plant noise rating level does not exceed the existing background noise level outside any noise sensitive residential window then the plant noise is of “low impact”.

## **5.6 World Health Organisation Guidelines on Community Noise**

BS8233:2014 is based upon the current World Health Organisation (WHO) guidance *“Guidelines on Community Noise”*. A summary of the noise guidelines relevant to the proposed scheme is presented in the table below.



Residential Environment	Critical Health Effect(s)	L <sub>Aeq</sub>	L <sub>AFmax</sub>	Time Base
Outdoor living area	Serious annoyance, daytime and evening	55	-	07:00-23:00
	Moderate annoyance, daytime and evening	50	-	07:00-23:00
Dwelling, indoors	Speech intelligibility and moderate annoyance, daytime and evening	35	-	07:00-23:00
Inside bedrooms	Sleep disturbance, night-time	30	45	23:00-07:00
Outside bedrooms	Sleep disturbance, window open (outdoor values)	45	60	23:00-07:00

These WHO guidelines are based, in almost all cases, on the lower threshold below which the occurrence rates of any particular effect can be assumed to be negligible.

## 5.7 Statutory Noise Nuisance

There is no quantitative definition of statutory noise nuisance. It is generally accepted however, that if the plant noise level is at least 5dB (or 10dB if tonal) below the minimum background L<sub>90(15minutes)</sub> at 1m from the nearest noise sensitive residential window, then the risk of a statutory noise nuisance is avoided. By adopting this as a design criterion the guidance contained in BS 4142:2014 should also be complied with.

## 6.0 Plant Noise Emission Criteria

### 6.1 Constantly Running Plant

On the basis of the requirements of the Local Authority (outlined in Section 5.4) above and the results of the environmental noise survey (see 28791/ADS1), we propose that the following plant noise emission criteria be achieved at 1 metre from the nearest noise sensitive residential window.

Position	Plant Noise Emission Criteria (dBA) At 1m from the nearest noise sensitive residential window	
	Daytime (07:00 – 23:00 hours)	Night-time (23:00 – 07:00 hours)
1	39dBA	37dBA
2	37dBA	35dBA
3	42dBA	42dBA



Position	Plant Noise Emission Criteria (dBA) At 1m from the nearest noise sensitive residential window	
	Daytime (07:00 – 23:00 hours)	Night-time (23:00 – 07:00 hours)
4	40dBA	39dBA

The above criteria are based on a level of 10dB below background in order to fall into Camden’s ‘Green’ criteria for **dwelling**s. Whilst we understand that Camden considers other uses noise sensitive, the Local plan states that the criteria is use dependent but does not define criteria that correspond to ‘Green’, ‘Amber’, or ‘Red’ for these other uses. We request that Camden clarify their policy in this respect. The criteria could be relaxed by 5dB in line with the ‘Amber’ criteria in Camden’s Local Plan, which may be acceptable to Camden depending on ‘the context of other merits of the development’.

It should be noted that the above are subject to the final approval of the Local Authority.

## 6.2 Commercial/Office Windows

The requirements of the London Borough of Camden (outlined in Section 5.4) states “*Levels are given for dwellings, however, levels are use specific and different levels will apply dependant on the use of premises*” and does not offer specific guidance for office windows.

However, at the nearest commercial properties, it is generally acceptable to design plant such that the guidelines of BS 8233: 2014 “Sound insulation and noise reduction for buildings – Code of Practice” to be satisfied.

In relation to the commercial properties within the vicinity of the proposed location of the new plant, Table 6 of this standard states that for “reasonable conditions for study and work requiring concentration”, the following internal ambient noise level design range should be satisfied.

Internal Ambient Noise Level Design Range, $L_{Aeq,T}$
35-50

In addition, BS 8233 states that attenuation of 10 to 15 dB can be provided by an open window. Hence the following external noise level criteria must be satisfied outside the nearest office façade (based on achieving the above design range):

External Ambient Noise Level Limit, $L_{Aeq,T}$
45-65



55dBA is generally as an acceptable external ambient noise level for plant installations to achieve outside and office window. It is also notable that we understand the surrounding offices are generally open plan and have sealed (non-openable) windows therefore a more relaxed criterion may be suitable.

It should be noted that the above criteria are subject to final approval by the London Borough of Camden.

### **6.3 Emergency and Standby Plant**

For life safety standby plant, only used in emergencies and occasional testing - e.g. smoke extract fans and life safety generators - relaxations of the internal and external criteria are normally acceptable but should comply with Local Authority and occupational requirements and must not interfere with internal audible emergency alarms.

The Camden Local Plan (2017) states the following:

*“6.100 Emergency equipment such as generators which are only to be used for short periods of time will be required to meet the noise criteria of no more than 10dB above the background level (L90 15 minutes)...”*

The standby/emergency plant including the generator and smoke extraction plant should therefore not exceed the following noise criteria during monthly testing, which would usually be for periods less than one hour.

## **7.0 Conclusions**

An environmental noise survey has been previously undertaken in order to establish the currently prevailing noise levels.

Plant noise emission criteria have been recommended based on the results of the noise survey and with reference to the Local Authority's requirements.

## Appendix A

The acoustic terms used in this report are defined as follows:

**dB** Decibel - Used as a measurement of sound level. Decibels are not an absolute unit of measurement but an expression of ratio between two quantities expressed in logarithmic form. The relationships between Decibel levels do not work in the same way that non-logarithmic (linear) numbers work (e.g. 30dB + 30dB = 33dB, not 60dB).

**dBA** The human ear is more susceptible to mid-frequency noise than the high and low frequencies. The 'A'-weighting scale approximates this response and allows sound levels to be expressed as an overall single figure value in dBA. The <sub>A</sub> subscript is applied to an acoustical parameter to indicate the stated noise level is A-weighted

It should be noted that levels in dBA do not have a linear relationship to each other; for similar noises, a change in noise level of 10dBA represents a doubling or halving of subjective loudness. A change of 3dBA is just perceptible.

**L<sub>90,T</sub>** L<sub>90</sub> is the noise level exceeded for 90% of the period *T* (i.e. the quietest 10% of the measurement) and is often used to describe the background noise level.

**L<sub>eq,T</sub>** L<sub>eq,T</sub> is the equivalent continuous sound pressure level. It is an average of the total sound energy measured over a specified time period, *T*.

**L<sub>max</sub>** L<sub>max</sub> is the maximum sound pressure level recorded over the period stated. L<sub>max</sub> is sometimes used in assessing environmental noise where occasional loud noises occur, which may have little effect on the L<sub>eq</sub> noise level.

Sound Pressure Level (L<sub>p</sub>) is the sound pressure relative to a standard reference pressure of 2 x 10<sup>-5</sup> Pa. This level varies for a given source according to a number of factors (including but not limited to: distance from the source; positioning; screening and meteorological effects).

Sound Power Level (SWL or L<sub>w</sub>) is the total amount of sound energy inherent in a particular sound source, independent of its environment. It is a logarithmic measure of the sound power in comparison to a specified reference level (usually 10<sup>-12</sup> W).