



Plant Noise Assessment

For

89 Plender Street, London

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CONTENTS:

1	INTRODUCTION	1
2	SITE	2
3	GUIDANCE	3
4	MEASUREMENTS	6
5	EQUIPMENT	7
6	RESULTS	8
7	PLANT ASSESSMENT	10
8	CONCLUSION	11

APPENDIX A:	Glossary of Technical Terms
APPENDIX B:	Site Plan & Measurement Location
APPENDIX C:	Planning Policy
APPENDIX D:	Survey Results (Tabular)
APPENDIX E:	Survey Results (Graphical)



1 INTRODUCTION

1.01 CSG Acoustics has been appointed by The Wesley to undertake a noise assessment to support a planning application for 89 Plender Street, London, NW1 0JN.

1.02 A number of plant items are to be installed on the roof of the site, and therefore a noise assessment is required in accordance with Camden Borough Council's planning policy.

1.03 The assessment includes:

- The results of a noise survey conducted at the site over a typical daytime / night-time period;
- Plant noise limits based on the Local Authority's planning policy;

1.04 This report is technical in nature, therefore to assist the reader explanations of the relevant terminology are presented in Appendix A.

2 EXISTING AND PROPOSED SITE

2.01 89 Plender Street is the site of New Camden Chapel, a Methodist Church which has been occupied since the late 19th century.

2.02 The site is located at the corner of Plender Street and Kings Terrace, north-east of Mornington Crescent Tube station and east of Camden High Street.

2.03 The site is bound by the following;

- North – Plender Street with three-storey mixed-use (commercial ground floor – potential residential above) with similar properties beyond;
- East – Karavas Restaurant, a three storey mixed-use (commercial ground floor – potential residential above) with similarly sized properties beyond;
- South – The rear access to properties fronting Bayham Street; and
- West – Kings Terrace, a lightly trafficked cul de sac with mixed-use (commercial ground floor – potential residential above) three storey properties beyond.

2.04 Proposals are to convert the existing church building into a mixed-use development, including church uses at lower ground and upper ground floors with hotel accommodation at 1st, 2nd, 3rd and 4th floors.

2.05 As part of the redevelopment of the site it is likely that a number of items of plant will be installed at the rooftop of the site, within a dedicated plant enclosure.

2.06 The proposed items of plant are yet to be selected, however they are likely to include an Air Handling Unit and associated Air Conditioning (AC) units.

3 GUIDANCE

3.01 This assessment has been undertaken in accordance with National and Local planning policy and relevant British Standards.

3.02 A summary of the pertinent points of each document is presented below, with a more detailed summary presented in Appendix C.

National Planning Policy

3.03 The National Planning Policy Framework (NPPF) and the Noise Policy Statement for England (NPSE) form the overarching noise policy for developments within England and the UK.

3.04 A summary of the four aims of the NPPF are presented below;

- avoid noise from giving rise to significant adverse impacts;
- mitigate noise and reduce to a minimum;
- recognise that development will often create some noise; and
- identify and protect areas of tranquillity.

3.05 The NPPF does not provide any detail with regards to criteria or impacts relating to noise. However, the NPSE, which is referenced with regards to the NPPF, has similar aims and provides the following effect categorisations;

“NOEL – No Observed Effect Level

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

LOAEL – Lowest Observed Adverse Effect Level

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

2.21 Extending these concepts for the purpose of this NPSE leads to the concept of a significant observed adverse effect level.

SOAEL – Significant Observed Adverse Effect Level

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

3.06 It is not made clear in either document, the noise level at which the ‘effect’ is triggered.

3.07 As such, and with relation to this application, it is standard practice to rely on the guidance contained in British Standard (BS) 4142:2014 – ‘*Methods for rating and assessing industrial and commercial sound*’ which provides a framework to predict noise related impacts associated with items of fixed plant.

3.08 BS4142 states;

“The likelihood of noise provoking complaints is assessed by subtracting the background noise level from the rating noise level.

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

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

c) A difference of around +5 dB 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.”

3.09 Relating the above back to the aims of the NPPF and ‘effects’ listed in the NPSE would imply the following;

- SOAEL : 10dB above the measured background noise level;
- LOAEL : 5dB above the measured background noise level; and
- NOEL : 10dB below the measured background noise level.

3.10 The above ‘effect’ levels form the basis of this assessment against the aims of the NPPF.

Local Planning Policy

3.11 Camden Borough Council’s ‘development plan’ alongside the ‘Mayor’s London Plan’ form the basis for planning decisions in the borough.

3.12 The Mayor’s London Plan sets out an integrated economic, environmental, transport and social framework for the development of the capital over the next 20–25 years. The aims set out in the London Plan reflect those provided in both the NPPF and NPSE.

3.13 Camden’s Local Development Framework consists of a number of documents, including the Core Strategy, Development Policies and Camden Planning Guidance.

3.14 The Core Strategy (2010–2025) sets out the key vision for the borough and lists DP28 Noise and Vibration as a Development Policy, which sets out detailed planning criteria that is used to determine applications for planning permission in the borough.

Development Policy 26 (DP26) references noise and vibration by stating;

“The Council will protect the quality of life of occupiers and neighbours by only granting permission for development that does not cause harm to amenity.”

3.15 The pertinent text stated in Policy D28 relating to this application is reproduced below as an extract from Table E of that policy;

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	55dBLAeq'

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

- 3.16 A noise sensitive development is stated in the policy as including housing, schools and hospitals as well as offices, workshops and open spaces.
- 3.17 It is likely that none of the proposed items will exhibit the characteristics in the second and third rows of Table E, for the purposes of this assessment, the design target will be to ensure that the rating noise (L_{Ar}) level of the new plant is at least 5dB less than the existing background noise at the noise sensitive locations.
- 3.18 With regard to the aspirations of the NPPF and NPSE the limits adopted above would suggest that noise emissions would be considered to have a low impact, depending on the noise conditions and site context and would therefore be categorised as being between the NOEL and the LOAEL.

4 MEASUREMENTS

4.01 Environmental noise measurements have been carried out over a typical weekday period, between 13:00 hours on 7th October 2015 and concluded the same time the following day, to establish the existing noise levels at the site. The survey methodology and results are set out below.

4.02 Noise measurements have been carried out at the following two locations:

- Position 1: located outside the northern-most window of the western elevation of the site. The microphone was located at the approximate height of neighbouring third floor windows and was located 1m from the external elevation of the building and is therefore considered to be a façade measurement. This measurement location was chosen to represent background noise levels to the west and rear of the site.
- Position 2: located outside the southern-most window of the eastern elevation of the site. The microphone was located at the approximate height of neighbouring third floor windows and was located 1m from the external elevation of the building, and is therefore considered to be a façade measurement. This measurement location was chosen to represent background noise levels to the east and rear of the site.

5 EQUIPMENT

5.01 The equipment used for the survey was as follows:

- 01dB Metravib Black Solo and Fusion Integrating Sound Level Meters conforming to Class 1 BS EN 61672, Type 1 BS EN 60804 & BS EN 60651: 1994;
- 01dB Metravib MCE 212 Condenser Microphone, PRE 21 S Pre-amp with Connecting Leads and 40 CE Condenser Microphone and PRE22 Pre-amp with connecting leads;
- 01dB Outdoor Microphone Kits; and
- Tripods.

Position 1 - NW Elevation	Sound Level Meter 01dB Black Solo	Serial No.	60672
		Calibration Date	12/03/2014
		Cal Certificate No.	CE-DTE-T-14-PVE-72841
	½" MCE 212 Condenser Mic.	Serial No.	80836
		Calibration Date	12/03/2014
		Cal Certificate No.	CE-DTE-T-14-PVE-72841
Position 2 - SE Elevation	Sound Level Meter 01dB Fusion	Serial No.	10816
		Calibration Date	26/05/2015
		Cal Certificate No.	CE-DTE-L-15-PVE-33750
	½" 40 CE Condenser Mic.	Serial No.	217624
		Calibration Date	26/05/2015
		Cal Certificate No.	CE-DTE-L-15-PVE-33750
Both Positions	Calibrator Model 4231	Serial No.	2153318
		Calibration Date	17 March 2014
		Cal. Certificate No.	01708/1

Table 5.1: Noise Survey Equipment

6 RESULTS

- 6.01 The weather during the survey was suitable for noise measurement, it being dry with little wind for the duration of the survey.
- 6.02 Noise sources at the site include local and distant road traffic and noise from localised items of plant. The eastern elevation of the site is dominated by noise from the kitchen extract that serves the rear of Karavas Street.
- 6.03 There were no other sources of noise considered abnormal for a mixed commercial/residential location in an inner city area.
- 6.04 A summary of the time averaged ambient levels, lowest measured background levels and the median of the measured background levels over the measurement periods are shown in Table 6.1. The lowest and median L_{A90} are based on a 15-minute measurement period.
- 6.05 Note that all measurements were undertaken at a distance of 1m from the external façade of the building. Therefore, measured noise levels are considered to have a reflected sound contribution which increases the measured level by 3dB. In light of this noise levels presented in Table 6.1 and beyond have been corrected by -3dB to account for the elevated measured noise.
- 6.06 Note that noise data presented in the appendix is as measured, and has not been corrected. Therefore appendix data should be regarded as 3dB higher than would be expected onsite.
- 6.07 A list of the levels measured (façade levels) is included in Appendix D and represented graphically in Appendix E (façade levels).

Measurement Position	Period	Average $L_{Aeq,T}$ - dB	Lowest/Median L_{A90} - dB
Position 1 - NW Elevation	Day time (0700-1900 hrs)	60.7	50.9/53.1
	Evening (1900-2300 hrs)	59.8	49.9/51.4
	Night-time (2300-0700 hrs)	55.4	41.7/45.2
Position 2 - SE Elevation	Day time (0700-1900 hrs)	53.1	44.6/48.5
	Evening (1900-2300 hrs)	51.1	46.1/47.5
	Night-time (2300-0700 hrs)	47.7	34.5/37.7
* All measured data corrected by -3dB to present a free-field level			

Table 6.1: Free-Field Measured Ambient and Lowest Background Noise Levels

6.08 The lowest and median of the measured L_{A90} noise level are presented to provide the reader an indication of the deviation from the likely 'typical' background noise level. The comparison provides information on if the measured lowest noise level is likely to be an anomaly in the data set.

7 PLANT ASSESSMENT

7.01 This report is to support a planning application at 89 Plender Street, which includes a number of proposed items of mechanical plant to be located on the rooftop of the site.

7.02 Based on the standard requirements of Camden Council and the lowest measured background noise level in each time period, Table 7.1 sets out the recommended noise limits, based on achieving 5dB below the measured background noise level at the two Measurement Positions.

Measurement Position	Period	Proposed Noise Limit L _{Ar}
1	Day	46
	Evening	45
	Night	37
2	Day	40
	Evening	41
	Night	30

Table 7.1: Suggested Plant Noise Emission Limits Based Measured L_{A90}, Free-field dB

7.03 Note that the limits suggested above are rating levels and as such any design should take into account the acoustic characteristics of the plant. In this instance the proposed units display none of the characteristics whereby the acoustic correction should be applied.

7.04 It should be noted that should any other items of plant be installed as part of the development (other than those proposed on the roof), the cumulative noise from all items should not exceed the limits stated in Table 7.1.

7.05 Assuming the proposed items meet the noise limits set out in Table 7.1 noise will be between the LOAEL and the NOEL with respect to the NPPF.

7.06 With regards to BS4142, the predicted noise levels would be below the measured background noise levels, therefore, would be considered to have a low impact on the noise climate surrounding the site.

7.07 With respect to the NPPF, achieving the noise limits would be classified as being between the LOAEL and the NOEL.

8 CONCLUSION

- 8.01 CSG Acoustics has been appointed by The Wesley to undertake a noise assessment to support a planning application for rooftop items of plant at 89 Plender Street, NW1 0JN.
- 8.02 The assessment has been carried out in accordance with national planning guidance and the requirements of Camden Council, and is based on an environmental noise survey conducted at the site over a mid-week period.
- 8.03 Plant noise limits have been set based on the methodology contained in BS4142, the results of a background noise survey and the requirements of DP28 of the Borough's Development Policies, to control the noise from the proposed units.
- 8.04 Assuming proposed items of plant meet the levels stated in Table 7.1 the requirements of DP28 (5dB below the measured background noise level) will be met at all assessment locations.
- 8.05 With regards to BS4142, the plant noise levels would be below the measured background noise levels and therefore would be considered to have a low impact on the noise climate surrounding the site.
- 8.06 Assuming the noise limits are met, assessing the site in accordance with the principles of the National Planning Policy Framework will ensure that predicted noise levels would be between the LOAEL and the NOEL.



APPENDIX A
GLOSSARY OF TECHNICAL TERMS

TECHNICAL TERMS AND UNITS

Decibel (dB) – The unit used to describe sound. A logarithmic scale is used to describe sound pressure levels and sound power levels. The logarithms used are to base 10; hence, an increase of 10dB in sound pressure level corresponds to a doubling in perceived loudness of the sound.

Sound Power Level (SWL) – This is a product of the source alone and is independent of its surroundings. It is a measure of the amount of sound power output measured in decibels.

Sound Pressure Level (SPL) – This is a function of the source and its surroundings and is a measure of the sound pressure at a point in space. The sound pressure measured or reported can be influenced by room/mounting conditions and the distance that the measurement is taken.

Octave Bands – The human ear is sensitive to sound over a range of approximately 20 Hz to 20 KHz and is generally more sensitive to medium and high frequencies than to low frequencies. In order to define the frequency content of a noise, the spectrum is divided into frequency bands and the sound pressure level is measured in each band. The most commonly used frequency bands are octave bands, in which the mid frequency of each band is twice that of the band below it.

"A" Weighting – A number of frequency weightings have been developed to imitate the ear's varying sensitivity to sound of different frequencies. The most commonly used weighting is the "A" weighting. The "A" weighted SPL can be measured directly or derived from octave or one-third octave band SPLs. The result is a single figure index which gives some idea of the subjective loudness of the sound, but which contains no information as to its frequency content.

Intermittency and Time-Weighting – The degree of annoyance caused by a noise also depends on its duration and intermittency of a noise. Intermittent, impulsive or repetitive noises tend to be more annoying than continuous noises. Various time-weightings have been derived to measure sounds of differing intermittences and these can be measured directly on modern equipment. The most common time-weightings in use are as follows:-

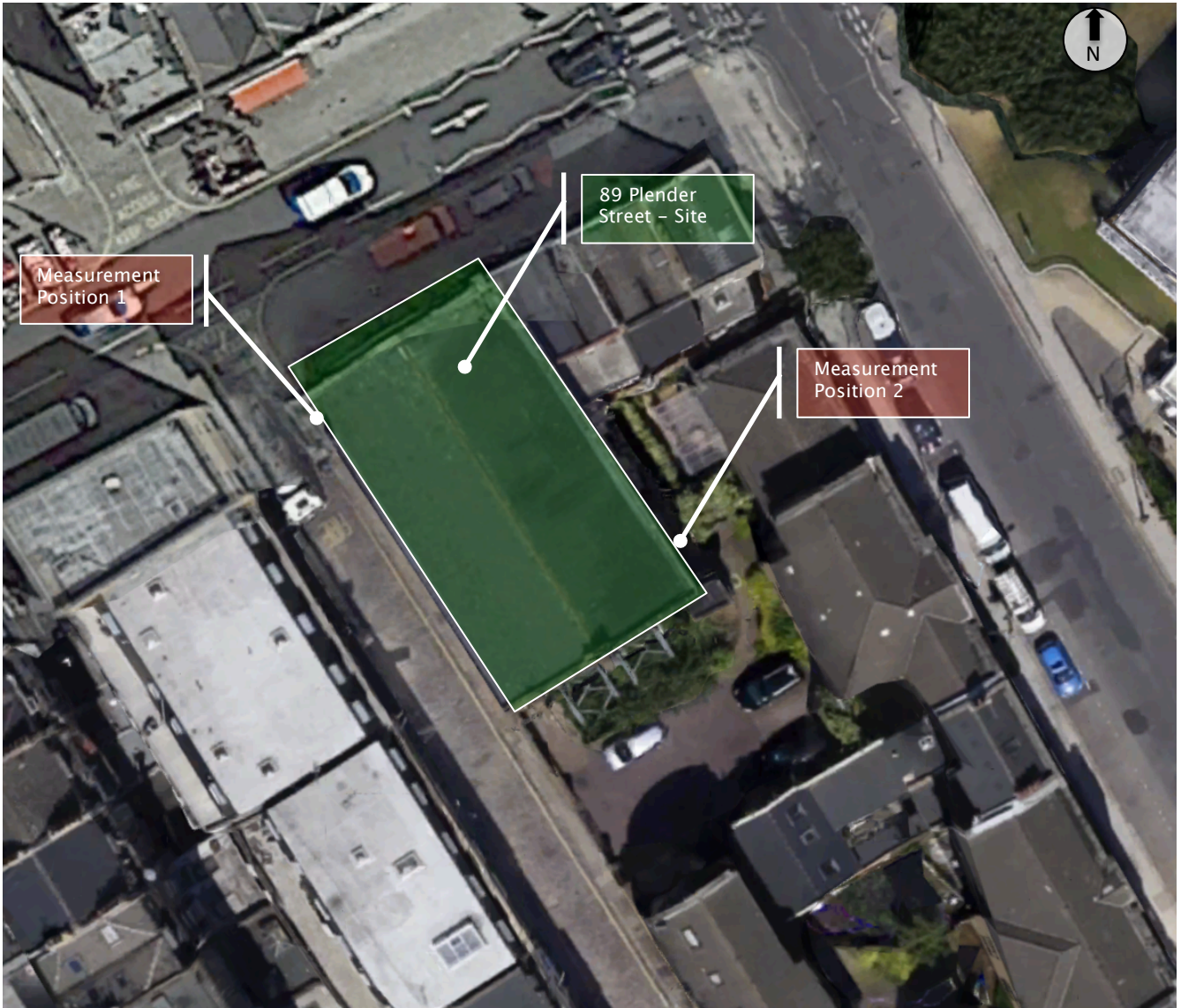
L_{90} This is the sound pressure level exceeded for 90% of the measurement period. It is widely used to measure background noise levels.

L_{eq} The equivalent continuous noise level is often used to measure intermittent noise. It is defined as the notional steady noise level that would contain the same acoustic energy as the varying noise. Because the averaging process used is logarithmic, the L_{eq} level tends to be dominated by the higher noise levels measured.



APPENDIX B

SITE PLAN & MEASUREMENT LOCATION





APPENDIX C
PLANNING POLICY
AND GUIDANCE

PLANNING POLICY AND GUIDANCE

National Planning Policy

National Planning Policy Framework and the Noise Policy Statement for England

The Department for Communities and Local Government published the National Planning Policy Framework (NPPF) on 27th March 2012 and upon its publication, the majority of planning policy statements and guidance notes were withdrawn, including Planning Policy Guidance 24 Planning and Noise, which previously presented the government's overarching planning policy on noise.

The NPPF contains four aims, which are set out at paragraph 123 in Section 11 of the document, titled *Conserving and enhancing the natural environment*:

“Planning policies and decisions should aim to:

avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;

mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions;

recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established; and

identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.”

The Department for Environment Food and Rural Affairs published the Noise Policy Statement for England (NPSE) in March 2010. The explanatory note of NPSE defines the following terms used in the NPPF:

“NOEL – No Observed Effect Level

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

LOAEL – Lowest Observed Adverse Effect Level

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

2.21 Extending these concepts for the purpose of this NPSE leads to the concept of a significant observed adverse effect level.

SOAEL – Significant Observed Adverse Effect Level

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

The NPSE does not define any of the above effect levels numerically.

The NPSE presents the Noise Policy Aims as:

“Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy and 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.”

It can be seen that the first two bullet points are similar to Section 11 of the NPPF, with a third aim that seeks to improve health and quality of life. The NPSE later expands on the Noise Policy Aims, stating:

“2.23 The first aim of the NPSE states that significant adverse effects on health and quality of life should be avoided while also taking into account the guiding principles of sustainable development (paragraph 1.8).

2.24 The second aim of the NPSE refers to the situation where the impact lies somewhere between LOAEL and SOAEL. It requires that 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 (paragraph 1.8). This does not mean that such adverse effects cannot occur.

2.25 This aim (the third aim), seeks where possible, positively to improve health and quality of life through the pro-active management of noise while also taking into account the guiding principles of sustainable development (paragraph 1.8), recognising that there will be opportunities for such measures to be taken and that they will deliver potential benefits to society. The protection of quiet places and quiet times as well as the enhancement of the acoustic environment will assist with delivering this aim.”

It is clear that noise described in the NPSE as SOAEL that would lead to significant adverse effects should be avoided, although there is no definition as to what constitutes a significant adverse effect. Similarly, noise should be mitigated where it is high enough to lead to adverse effects, termed the LOAEL, but not so high that it leads to significant adverse effects.

Local Planning Policy

London Plan (2015)

The Mayor's London Plan 2015 (FALP) presents the overall strategic plan for London, setting out an integrated economic, environmental, transport and social framework for the development of London over the next 20–25 years.

It is provided to ensure that Boroughs' local development documents are 'in general conformity' and is also legally part of the development plan that has to be taken into account when planning decisions are made in any part of London.

The document deals with transport, economic development, housing, culture, a range of social issues such as children and young people, health inequalities and food, a range of environmental issues such as climate change, air quality, noise and waste.

Chapter 7, London's living spaces and places, specifically references noise in Policy 7.15, pertinent elements of which are reproduced below;

Planning decisions

Development proposals should seek to manage noise by:

a – avoiding significant adverse noise impacts on health and quality of life as a result of new development;

b – mitigating and minimising the existing and potential adverse impacts of noise on, from, within, as a result of, or in the vicinity of new development without placing unreasonable restrictions on development or adding unduly to the costs and administrative burdens on existing businesses;

c – improving and enhancing the acoustic environment and promoting appropriate soundscapes (including Quiet Areas and spaces of relative tranquillity);

d – separating new noise sensitive development from major noise sources (such as road, rail, air transport and some types of industrial development) through the use of distance, screening or internal layout – in preference to sole reliance on sound insulation;

e – where it is not possible to achieve separation of noise sensitive development and noise sources, without undue impact on other sustainable development objectives, then any potential adverse effects should be controlled and mitigated through the application of good acoustic

it is clear from the above that the aims of the London Plan are in line with those presented in the NPPF and NPSE.

Planning Policy in Camden

The Council has adopted a number of planning documents that (alongside the Mayor's London Plan) form the Local Development Framework (LDF).

Included in the Council's planning documents are the Core Strategy, Development Policies and Camden Planning Guidance

The Core Strategy (2010–2025) sets out the key vision for the borough and lists DP28 Noise and Vibration as a Development Policy, which sets out detailed planning criteria that are used to determine applications for planning permission in the borough.

Development Policy 26 (DP26) references noise and vibration by stating;

“The Council will protect the quality of life of occupiers and neighbours by only granting permission for development that does not cause harm to amenity.”

It then goes on to site the mitigation measures stated in DP28.

'DP28 Noise and Vibration' sets out Camden Council's planning policy with regards to noise. We note that the policy refers to PPG24, which is no longer an extant planning document. Below is a copy of the text relevant to this application.

“DP28 Policy

The Council will seek to ensure that noise and vibration is controlled and managed and will not grant planning permission for:

a) development likely to generate noise pollution; or

b) development sensitive to noise in locations with noise pollution, unless appropriate attenuation measures are provided.

Development that exceeds Camden's Noise and Vibration Thresholds will not be permitted.

The Council will only grant permission for plant or machinery if it can be operated without cause harm to amenity and does not exceed our noise thresholds.

The Council will seek to minimise the impact on local amenity from the demolition and construction phases of development. Where these phases are likely to cause harm, conditions and planning obligations may be used to minimise the impact.

The effect of noise and vibration can be minimised by separating uses sensitive to noise from development that generates noise and by taking measures to reduce any impact. Noise sensitive development includes housing, schools and hospitals as well as offices, workshops and open spaces, while noise is generated by rail, road and air traffic, industry, entertainment (e.g. nightclubs, restaurants and bars) and other uses.

In assessing applications, we will have regard to the Noise and Vibration Thresholds, set out below. These represent an interpretation of the standards in PPG24 and include an evening period in addition to the day and night standards contained in the PPG, which provide a greater degree of control over noise and vibration during a period when noise is often an issue in the borough.”

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	55dB LAeq'

Camden Planning Guidance provides advice and information on how the Local Authority applies planning policies. The Guidance is to support the policies in the Local Development Framework (LDF) consistent with the core strategy and development policies that comprise our Local Development Framework (LDF).

Chapter 4 of CPG6 – *Amenity*, presents the key issues controlling and managing noise and vibration as;

- Limit the impact of existing noise and vibration sources on new development; and
- Limit noise and vibration emissions from new development.

It follows that DP28 of the Development Policy provides the associated noise and vibration limits.

British Standard 4142

British Standard (BS) 4142: 2014 *Methods for rating and assessing industrial and commercial sound* is intended to be used to assess whether noise from factories, industrial premises or fixed installations and sources of an industrial nature in commercial premises is likely to give rise to complaints from people residing in nearby dwellings.

The procedure contained in BS4142 for assessing the likelihood of complaints is to compare the “*specific sound level*”, which is the measured or predicted sound level from the source in question immediately outside the dwelling, with the background sound level.

NOTE 1 of paragraph 8.1.4 states that when determining the background sound level for the assessment;

“A representative level ought to account for the range of background sound levels and ought not automatically to be assumed to be either the minimum or modal value”

BS4142 provides various corrective methods depending on if the sound source is tonal (0 to +6dB), impulsive (0 to +9dB) or distinctive (0 to 3dB), which can be applied.

“The likelihood of noise provoking complaints is assessed by subtracting the background noise level from the rating noise level. BS4142 states:

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

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

c) A difference of around +5 dB 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.

NOTE 2 Adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact.”

In the context of the NPPF, it is considered that a situation between where BS4142 suggests a low impact (specific sound levels below the measured background noise level) and an indication of significant adverse impact (specific sound levels exceed +10dB above the measured background noise level) would equate to the Lowest Observed Adverse Effect Level (LOAEL).

Noise levels that are more than 10dB below the measured background would equate to the No Observed Effect Level (NOEL).

Setting plant noise limits in accordance with the requirements of the LA will result in noise levels between the LOAEL and the NOEL.

This assessment is carried out over a one hour period for the daytime and a fifteen minute period for the night-time. Day or night are not defined in the standard but it states that night should cover the times when the general adult population are preparing for sleep or are actually sleeping. For the purposes of this assessment, it is assumed that daytime and night-time are 07:00 to 23:00 hours and 23:00 to 07:00 hours respectively.

BS4142 has been referenced in setting noise limits for any fixed plant proposed as part of the proposed development.



APPENDIX D
SURVEY RESULTS
(TABULAR)

Period	LAeq	LA90	LAFMax
07/10/15 13:00:00:000	63.3	56.6	81.3
07/10/15 13:15:00:000	61.3	55.7	80.3
07/10/15 13:30:00:000	60.4	55.8	72.2
07/10/15 13:45:00:000	61.1	56.2	75.1
07/10/15 14:00:00:000	62.5	57.0	78.6
07/10/15 14:15:00:000	63.0	57.2	83.3
07/10/15 14:30:00:000	64.6	57.7	88.4
07/10/15 14:45:00:000	64.5	58.0	83.7
07/10/15 15:00:00:000	67.6	59.4	92.1
07/10/15 15:15:00:000	65.7	59.3	81.8
07/10/15 15:30:00:000	65.9	60.0	87.2
07/10/15 15:45:00:000	66.4	59.4	91.5
07/10/15 16:00:00:000	65.0	59.7	77.1
07/10/15 16:15:00:000	64.4	57.4	82.9
07/10/15 16:30:00:000	62.7	57.1	77.7
07/10/15 16:45:00:000	62.2	57.2	75.4
07/10/15 17:00:00:000	66.1	57.6	90.2
07/10/15 17:15:00:000	64.7	58.7	80.5
07/10/15 17:30:00:000	64.0	58.2	83.0
07/10/15 17:45:00:000	65.7	58.4	84.2
07/10/15 18:00:00:000	61.9	56.3	77.4
07/10/15 18:15:00:000	66.2	57.5	85.5
07/10/15 18:30:00:000	64.8	57.5	82.9
07/10/15 18:45:00:000	64.9	57.4	86.7
07/10/15 19:00:00:000	61.5	56.3	75.5
07/10/15 19:15:00:000	64.1	57.3	79.6
07/10/15 19:30:00:000	64.6	57.7	82.8
07/10/15 19:45:00:000	64.9	57.4	83.2
07/10/15 20:00:00:000	64.1	56.6	83.2
07/10/15 20:15:00:000	67.5	55.6	88.6
07/10/15 20:30:00:000	60.7	54.0	77.9
07/10/15 20:45:00:000	62.9	54.9	83.4
07/10/15 21:00:00:000	63.2	54.2	85.1
07/10/15 21:15:00:000	61.2	54.3	87.8
07/10/15 21:30:00:000	59.5	54.2	78.4
07/10/15 21:45:00:000	59.7	53.6	75.9
07/10/15 22:00:00:000	57.9	53.0	71.4
07/10/15 22:15:00:000	61.7	52.9	86.5
07/10/15 22:30:00:000	61.2	54.4	81.2
07/10/15 22:45:00:000	59.5	53.4	82.5
07/10/15 23:00:00:000	59.8	52.9	75.4

Period	L _{Aeq}	L _{A90}	L _{AFMax}
07/10/15 23:15:00:000	60.9	52.7	80.0
07/10/15 23:30:00:000	58.4	52.1	70.8
07/10/15 23:45:00:000	58.3	53.0	73.3
08/10/15 00:00:00:000	58.7	52.6	79.1
08/10/15 00:15:00:000	59.5	52.6	78.0
08/10/15 00:30:00:000	58.2	51.5	75.3
08/10/15 00:45:00:000	57.0	51.0	72.9
08/10/15 01:00:00:000	64.3	50.9	85.6
08/10/15 01:15:00:000	58.5	50.9	74.1
08/10/15 01:30:00:000	55.9	48.0	70.1
08/10/15 01:45:00:000	57.5	47.7	76.1
08/10/15 02:00:00:000	55.0	45.6	69.3
08/10/15 02:15:00:000	54.8	45.6	69.2
08/10/15 02:30:00:000	57.5	46.3	83.6
08/10/15 02:45:00:000	56.8	46.4	79.3
08/10/15 03:00:00:000	55.9	47.6	71.4
08/10/15 03:15:00:000	57.5	46.1	79.9
08/10/15 03:30:00:000	56.7	44.7	77.2
08/10/15 03:45:00:000	56.0	45.7	84.5
08/10/15 04:00:00:000	56.0	46.7	74.3
08/10/15 04:15:00:000	56.0	47.4	71.2
08/10/15 04:30:00:000	54.7	46.2	68.0
08/10/15 04:45:00:000	57.4	46.7	79.5
08/10/15 05:00:00:000	56.0	47.4	68.8
08/10/15 05:15:00:000	59.6	49.7	74.7
08/10/15 05:30:00:000	56.4	47.4	70.8
08/10/15 05:45:00:000	56.9	48.3	68.7
08/10/15 06:00:00:000	57.0	49.4	72.4
08/10/15 06:15:00:000	59.5	50.7	76.7
08/10/15 06:30:00:000	61.4	53.8	80.3
08/10/15 06:45:00:000	60.4	54.0	75.4
08/10/15 07:00:00:000	61.2	55.0	79.9
08/10/15 07:15:00:000	62.4	54.4	83.6
08/10/15 07:30:00:000	61.9	55.0	76.5
08/10/15 07:45:00:000	60.4	54.0	74.8
08/10/15 08:00:00:000	61.8	54.5	85.0
08/10/15 08:15:00:000	63.3	54.9	95.2
08/10/15 08:30:00:000	66.4	55.3	101.3
08/10/15 08:45:00:000	61.9	55.7	85.8
08/10/15 09:00:00:000	61.8	56.0	79.5
08/10/15 09:15:00:000	61.2	55.3	80.9

Period	L _{Aeq}	L _{A90}	L _{AFMax}
08/10/15 09:30:00:000	62.1	55.4	75.9
08/10/15 09:45:00:000	61.0	53.9	74.2
08/10/15 10:00:00:000	66.4	56.0	91.8
08/10/15 10:15:00:000	62.6	56.4	79.6
08/10/15 10:30:00:000	60.1	54.6	78.0
08/10/15 10:45:00:000	61.8	55.5	78.1
08/10/15 11:00:00:000	60.0	54.3	73.3
08/10/15 11:15:00:000	63.0	55.5	81.9
08/10/15 11:30:00:000	63.8	55.0	81.6
08/10/15 11:45:00:000	59.9	54.6	74.9
08/10/15 12:00:00:000	61.6	55.9	86.2
08/10/15 12:15:00:000	62.7	55.8	77.9

Table E.1: Noise Measurements Position 1, Façade

Period	L _{Aeq}	L _{A90}	L _{AFMax}
07/10/15 13:15:00:000	54.9	51.1	69.4
07/10/15 13:30:00:000	54.6	51.5	66.7
07/10/15 13:45:00:000	54.7	51.5	67.6
07/10/15 14:00:00:000	56.5	52.9	68.7
07/10/15 14:15:00:000	56.4	52.4	65.2
07/10/15 14:30:00:000	59.0	53.0	79.7
07/10/15 14:45:00:000	56.4	52.6	71.7
07/10/15 15:00:00:000	57.0	52.7	73.6
07/10/15 15:15:00:000	56.2	52.5	69.0
07/10/15 15:30:00:000	56.8	53.0	67.2
07/10/15 15:45:00:000	56.7	52.6	75.4
07/10/15 16:00:00:000	56.9	52.9	70.0
07/10/15 16:15:00:000	56.0	52.0	69.0
07/10/15 16:30:00:000	56.5	52.4	70.3
07/10/15 16:45:00:000	55.1	51.5	76.0
07/10/15 17:00:00:000	57.5	52.4	78.6
07/10/15 17:15:00:000	55.7	51.9	70.2
07/10/15 17:30:00:000	56.3	51.7	73.7
07/10/15 17:45:00:000	55.6	52.0	66.1
07/10/15 18:00:00:000	54.5	51.0	65.2
07/10/15 18:15:00:000	56.1	51.4	75.8
07/10/15 18:30:00:000	59.8	52.1	81.7
07/10/15 18:45:00:000	56.2	51.9	74.3
07/10/15 19:00:00:000	54.7	50.7	68.5
07/10/15 19:15:00:000	54.9	51.6	72.0

Period	LAeq	LA90	LAFMax
07/10/15 19:30:00:000	55.2	51.5	69.8
07/10/15 19:45:00:000	54.4	50.9	67.9
07/10/15 20:00:00:000	54.2	50.8	67.2
07/10/15 20:15:00:000	54.2	50.8	64.3
07/10/15 20:30:00:000	54.4	50.5	71.6
07/10/15 20:45:00:000	54.7	50.4	69.6
07/10/15 21:00:00:000	53.2	49.9	68.8
07/10/15 21:15:00:000	54.4	50.3	69.6
07/10/15 21:30:00:000	54.0	50.5	72.0
07/10/15 21:45:00:000	53.6	50.0	66.8
07/10/15 22:00:00:000	52.3	49.1	63.5
07/10/15 22:15:00:000	53.2	49.7	65.4
07/10/15 22:30:00:000	52.9	49.7	68.5
07/10/15 22:45:00:000	53.8	49.9	69.1
07/10/15 23:00:00:000	54.7	48.1	70.3
07/10/15 23:15:00:000	51.6	44.6	64.0
07/10/15 23:30:00:000	50.7	42.1	65.5
07/10/15 23:45:00:000	50.0	43.1	60.8
08/10/15 00:00:00:000	50.6	43.1	72.7
08/10/15 00:15:00:000	49.7	41.8	64.3
08/10/15 00:30:00:000	51.3	42.6	69.6
08/10/15 00:45:00:000	50.0	41.2	74.2
08/10/15 01:00:00:000	51.3	40.6	69.9
08/10/15 01:15:00:000	52.1	41.6	71.5
08/10/15 01:30:00:000	49.3	39.3	63.2
08/10/15 01:45:00:000	48.4	40.0	62.0
08/10/15 02:00:00:000	48.5	38.6	65.2
08/10/15 02:15:00:000	47.9	38.1	61.2
08/10/15 02:30:00:000	48.6	38.4	62.3
08/10/15 02:45:00:000	47.2	38.1	63.9
08/10/15 03:00:00:000	48.3	38.6	60.4
08/10/15 03:15:00:000	46.2	37.6	59.5
08/10/15 03:30:00:000	49.6	39.0	66.1
08/10/15 03:45:00:000	46.5	37.5	60.6
08/10/15 04:00:00:000	49.9	39.6	67.0
08/10/15 04:15:00:000	48.9	37.6	66.6
08/10/15 04:30:00:000	49.0	38.3	64.7
08/10/15 04:45:00:000	54.4	38.5	76.2
08/10/15 05:00:00:000	48.8	40.2	61.0
08/10/15 05:15:00:000	52.6	42.8	68.8
08/10/15 05:30:00:000	49.6	40.8	66.2

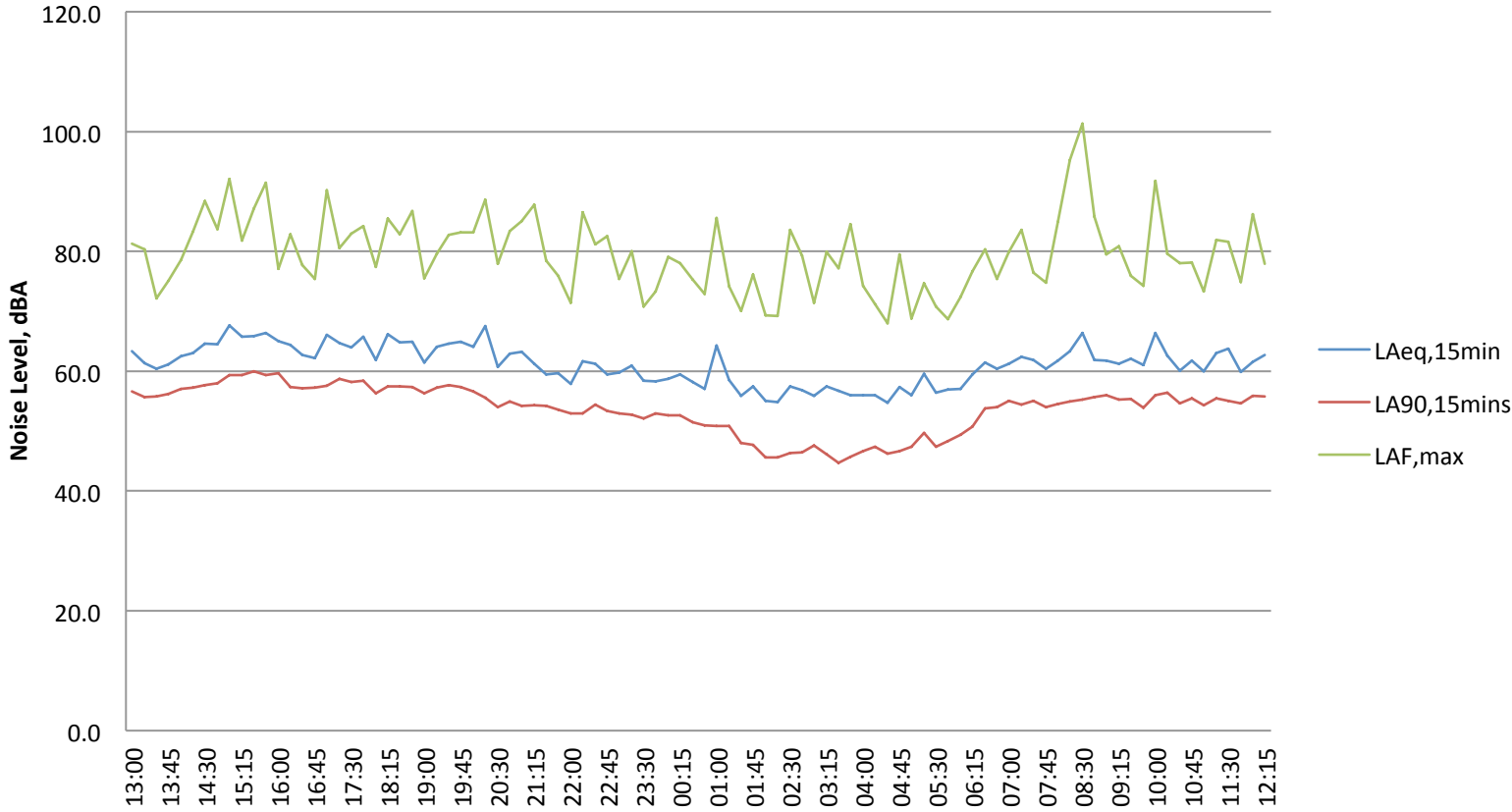
Period	L _{Aeq}	L _{A90}	L _{AFMax}
08/10/15 05:45:00:000	50.1	42.1	62.1
08/10/15 06:00:00:000	50.5	43.9	60.3
08/10/15 06:15:00:000	51.2	43.9	64.1
08/10/15 06:30:00:000	53.6	45.8	70.9
08/10/15 06:45:00:000	54.6	47.0	71.0
08/10/15 07:00:00:000	54.8	47.6	72.1
08/10/15 07:15:00:000	55.3	48.9	66.9
08/10/15 07:30:00:000	54.7	49.1	66.6
08/10/15 07:45:00:000	55.2	49.5	70.8
08/10/15 08:00:00:000	55.8	49.8	78.1
08/10/15 08:15:00:000	54.1	49.5	66.8
08/10/15 08:30:00:000	54.6	49.5	69.7
08/10/15 08:45:00:000	56.4	51.5	74.2
08/10/15 09:00:00:000	55.1	51.2	69.8
08/10/15 09:15:00:000	55.4	49.4	73.9
08/10/15 09:30:00:000	56.2	50.3	71.2
08/10/15 09:45:00:000	53.6	48.0	68.2
08/10/15 10:00:00:000	60.5	49.9	81.9
08/10/15 10:15:00:000	53.7	47.8	64.3
08/10/15 10:30:00:000	54.9	49.1	69.4
08/10/15 10:45:00:000	53.9	48.8	65.1
08/10/15 11:00:00:000	56.0	52.6	69.0
08/10/15 11:15:00:000	57.4	53.0	70.1
08/10/15 11:30:00:000	56.4	52.7	67.1
08/10/15 11:45:00:000	55.1	52.2	70.1
08/10/15 12:00:00:000	55.1	52.2	66.0
08/10/15 12:15:00:000	54.8	51.5	70.9
08/10/15 12:30:00:000	55.0	51.5	66.8

Table E.2: Noise Measurements Position 2, Façade



APPENDIX E
SURVEY RESULTS
(GRAPHICAL)

89 Plender Street - Position 1 NW Facade



89 Plender Street - Position 2 SE Facade

