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Noise Impact Assessment

96 – 98 Camden High Street, London. NW1 0LQ.

Application Number: To be confirmed.

Change of use of second and third floors from Offices (Use Class E) to Residential Flats (Use Class C2) including roof extension to provide an additional flat and refurbishment of the building exterior.

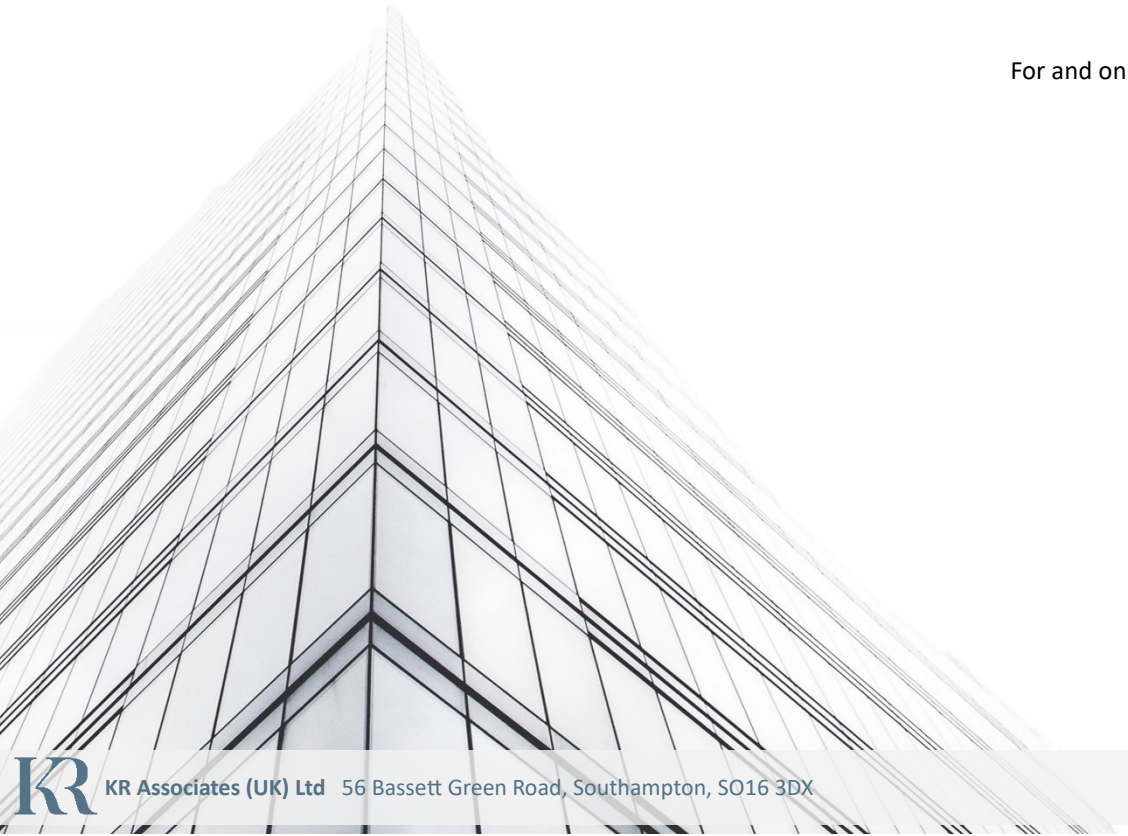
Full Planning Application

KR07500

Version: 1.2

31st May 2024

Mr. R. M. Scrivener, MSc, MIOA
For and on behalf of KR Associates (UK) Ltd



Quietly Confident…

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1 Executive Summary

1.1 Introduction and Scope of Report

1.1.1 KR Associates (UK) Ltd have been instructed to prepare a noise impact assessment to support the planning application for the following development at 96 – 98 Camden High Street in London for the following development:

> *"Change of use of second and third floors from Office (Use Class E) to Residential Flats (Use Class C3), including roof extension to provide additional flats and refurbishment of building exterior."*

1.1.2 The report will determine if future occupants will be exposed to noise that will comply with the Local Development Plan where it is material to the application and any other relevant material considerations as required by Section 38 (6) of the Planning and Compulsory Purchase Act 2004 and section 70 (2) of the Town and Country Planning Act 1990. Consideration will be given to the following sources of noise and vibration.

a) Traffic noise on Camden High Street and other anonymous noise sources.
b) Halifax mechanical services on the 1st floor flat roof at the front of the site (Permission 2011/5023/P).
c) Music practice rooms at 3rd floor of 14 and 4th floor of 15 Pratt Mews (Permission 2011/0249/P).

1.1.3 The report will determine the mitigation measures that will be required to be incorporated within the development to ensure compliance with the Local Development Plan and all other material considerations.

1.1.4 The report follows the general guidance within British Standard 4142: 2014 + A1: 2019 to determine the initial impact of the mechanical service of the Halifax Building Society within the context of the site. The report then uses the general methodology within British Standard 8233: 2014 to assess the internal noise levels within the proposed development with the windows closed and open from all the sources of noise. The main body of the report is broken down into the following sections with references and exerts from the appropriate standards provided in the Appendices of the report.

Section 1)	Introduction and an executive summary and conclusions.
Section 2)	Description of the main sources of noise and the noise sensitive properties.
Section 3)	Proposed noise criterion to determine compliance with the Local Development Plan.
Section 4)	Ambient and background noise levels of the existing site.
Section 5)	Calculation and assessment of the impact of noise and vibration.
Section 6)	Conclusions, discussions and recommendations.

1.1.5 Mr. Rhys Scrivener prepared this report on behalf of KR Associates (UK) Ltd for their client. The report only relates to the current planning application and should not be copied, disseminated or used for any other purpose. Mr. Rhys Scrivener holds a Master of Science Degree in Noise and Noise Control from the Open University (MSc) and has been a full member of the Institute of Acoustics since 1999 (MIOA). The report is prepared in line with the Code of Conduct of the Institute of Acoustics.

1.2 Executive Summary of Report

1.2.1 The proposed development proposes to convert the second and third floor offices and extend the building upwards to the fourth floor to create 6-No residential flats. It is proposed that internal noise levels within any of the habitable rooms should not exceed 35 dB $L_{Aeq,\ 16\ hours}$ and 60 dB $L_{Amax,\ fast}$ during the day time (07:00 to 23:00) and 30 dB $L_{Aeq,\ 8\ hours}$ and 45 dB $L_{Amax,\ fast}$ during the night time (23:00 to 07:00). Consideration should also be taken on the impact of opening windows to control over-heating.

1.2.2 The current ambient noise levels measured on the site are 72 dB $L_{Aeq,\ 16\ hour}$ and 95 dB $L_{Amax,\ 10\text{-}event}$ during the day time and 70 dB $L_{Aeq,\ 8\ hour}$ and 88 dB $L_{Amax,\ 10\text{-}event}$ during the night time. The development will need to include acoustic glazing with a minimum laboratory performance of R_w 40 dB and a full MVHR ventilation system with additional cooling to meet the proposed internal noise criterion.

1.3 Conclusion of Report

1.3.1 The proposed mitigation measures will ensure that the proposed development gives rise to acceptable noise levels for future residents and does not have a detrimental impact on the existing operation of the Halifax Building Society on the ground and 1st floor of the development site or the music practice rooms at 14 and 15 Pratt Mews. The proposed development complies with the relevant parts of the Local Development Plan (Policies A1 and A4) and all other relevant material considerations.

1.3.2 The proposed development also fully complies with the specific criterion included within Appendix 3 of the Camden Local Plan. This requires the average noise levels not to exceed 35 dB $L_{Aeq,\ 16\ hours}$ during the day time and 30 dB $L_{Aeq,\ 8\ hours}$ during the night time and maximum noise level not to exceed 42 dB $L_{Amax,\ fast}$ during the night time to ensure the levels are rated *"Green"* and fall below the Lowest Observed Effect Level (LOEL).

1.4 Objection from Commercial Properties

1.4.1 Following submission of the report KR07500 v1.1 to the Local Authority, two objections have been received from the operators of entertainment venues near the proposed development site. Additional information is provided within Appendix E of this report to evaluate the concerns raised.

a) The Blues Kitchen, 111 – 113 Camden High Street, London. NEW1 7JN.
b) Camden Head Public House, 100 Camden High Street, London. NW1 0LU.

2 Source of Noise and Noise Sensitive Receptors

2.1 General Position and Layout of Site

2.1.1 The proposed development site is located at the junction of Camden High Street and Pratt Street. The existing building consists of the Halifax Building Society on the ground and 1st floor. The offices on the 2nd and 3rd floor have been vacant for some time. There is currently a telecommunication facility on the roof of the building.

Figure 1 – General location plan of the development

2.1.2 The existing building has a single storey flat roof extension to the front of the building facing onto Camden High Street and the remaining building is concrete framed with a brick and block façade and flat roof. It is believed that the building was constructed in the 1970's and currently falls within a conservation area. There is a preference to use sliding aluminimum sash windows with a maximum glazing depth of 28 mm.

2.2 Mechanical Equipment Associated with the Halifax

2.2.1 Camden Council granted planning permission under reference 2011/5023/P for the *"Installation of 5 air conditioning unts (removal of 2 existing air conditioning units) on the front first floor level"* on 2nd December 2011. The following is an extract from the drawings submitted and referenced in the planning application.

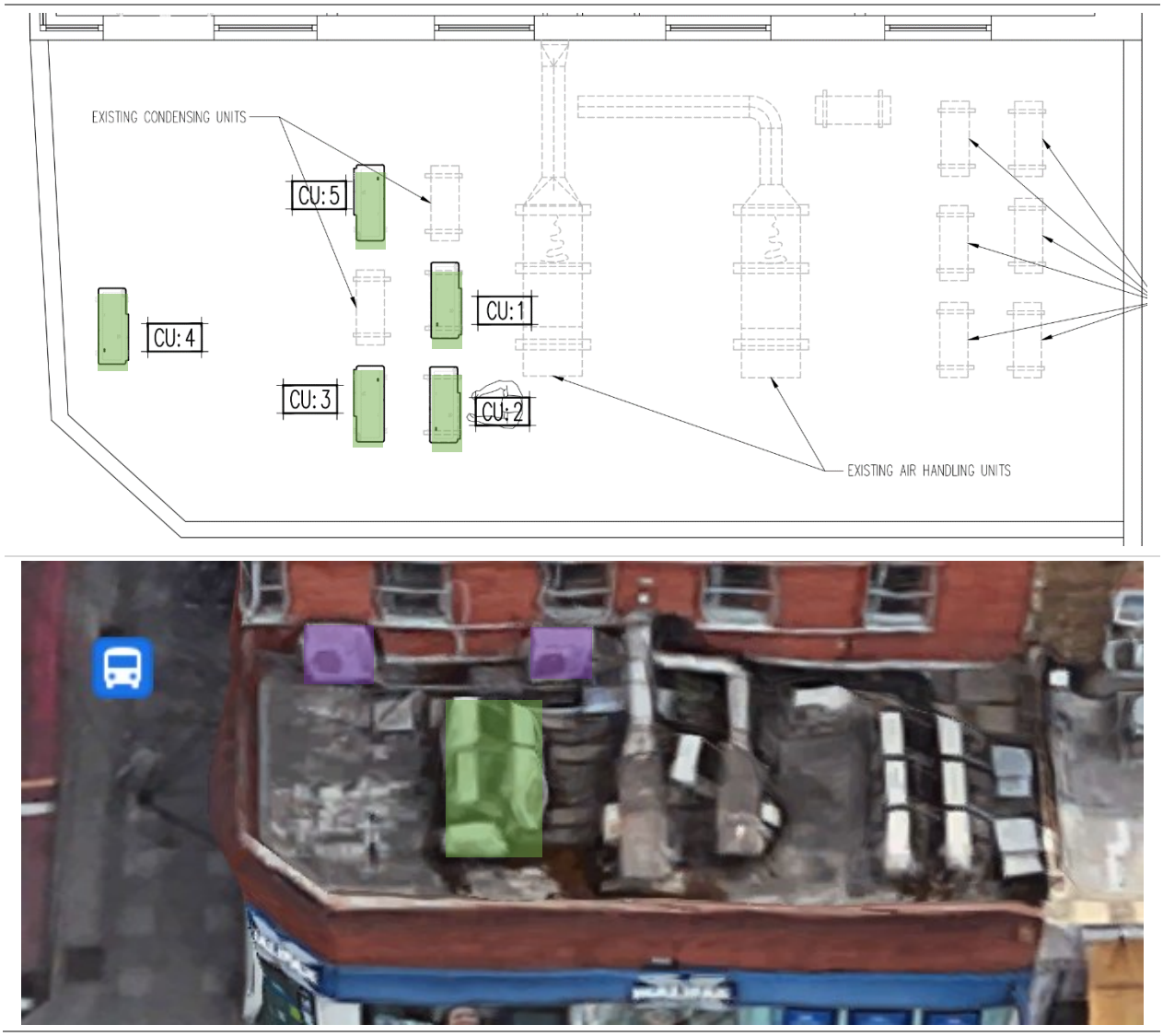


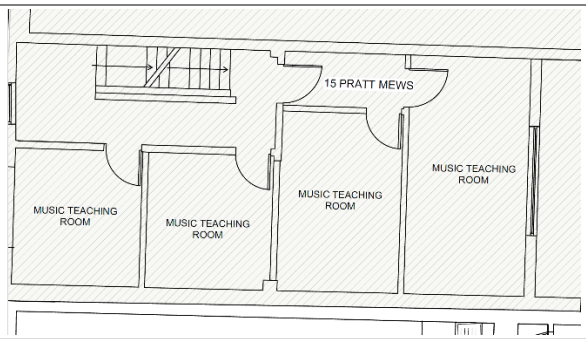
Figure 2 – Halifax Building Society 1st floor plant area at the front of the site

2.2.2 The planning application was supported by a noise impact assessment which confirmed the 5-No condensing units had a sound pressure level of 46 dB(A) measured 1m from the front of the unit each of which measured 0.80 m wide x 0.23 m deep x 0.30 m high. For each unit this would result in a parallelepiped measurement surface with an area of 19.2 m^2 and resultant sound power level of $L_{w(A)}$ 60 dB. It is understood that of the five units only one runs over night.

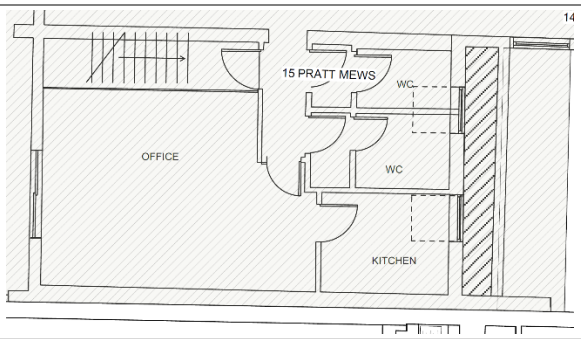
2.2.3 It would appear that since the application two further units have been installed on the lower part of the 1st floor office wall (coloured purple). For the purposes of the assessment, it is assumed that the Halifax Building Society will retain the 7-No AC. The assumed manufacturers data is included within Appendix C of the report.

2.3 Music Practice Rooms at 14 – 15 Pratt Mews

2.3.1 Camden Council granted planning permission under reference 2011/0249/P for the *"Change of use of the second floor of no 15 and the third floor of no. 14 Pratt Mews from offices (Class B1) to music teaching rooms (Class D1)"* in March 2011. The following extract is taken from the drawings of the existing building which show music practice rooms at second floor levels and associated offices at 3rd floor level.



2nd Floor of 15 Pratt Mews – Music Practice Rooms



3rd Floor 14 Pratt Mews – Offices (Music Practice Rooms)

Figure 3 – Layout of music practice rooms on the 2nd floor of 15 Pratt Mews and 3rd floor of 14 Pratt Mews

2.3.2 Condition 3 of planning permission 2011/0249/P required the submission of details of the sound insulation measures. It is not clear if this condition was formally discharged as the associated details could not be found on the Camden Council planning portal.

> *"3. Before the use commences sound insulation shall be provided for the building in accordance with a scheme to be first approved by the local planning authority. The use shall thereafter not be carried out other than in complete compliance with the approved scheme."*

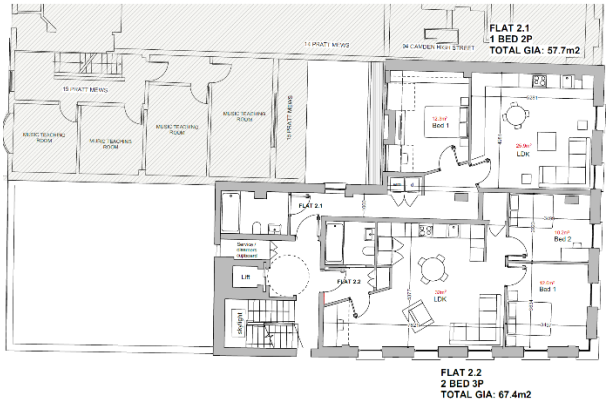
2.3.3 Condition 4 of planning permission 2011/0249/P was designed to protect the amenity of the adjoining properties by restricting the operational hours of the music practice rooms.

> *"4. The use hereby permitted shall not be carried out outside the following times 09:00 to 19:00 Mondays to Fridays and 10:00 to 17:00 on Saturdays. It shall not be carried out at any time on Sundays or Bank Holidays."*

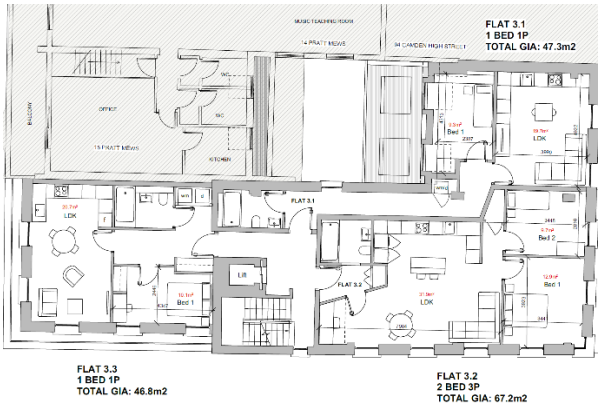
2.3.4 It is assumed that the music practice rooms have been adequately attenuated as per the requirements of condition 3 and that they only operate as per the requirements of condition 4 so that they do not disturb the nearby existing residential dwellings. There are currently residential flats at 16 Pratt Mews at the rear of the site at 2nd floor level and 17 Pratt Mews at 3rd floor level. The 3rd floor flat is adjoined to the music practice rooms and both flats have a window facing into the lightwell adjacent to the windows on the rear of the music practice rooms.

2.4 Proposed Floor Plans

2.4.1 It is proposed to convert the vacant 2nd and 3rd floors offices (Use Class B1) to create 2-No flats on the 2nd floor and 3-No flats on the 3rd floor (Use Class C3). The following are an extract from the submitted drawings.



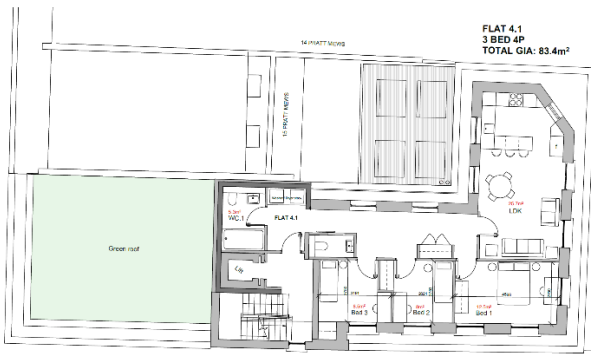
Propsoed 2nd Floor (2-No Flats)



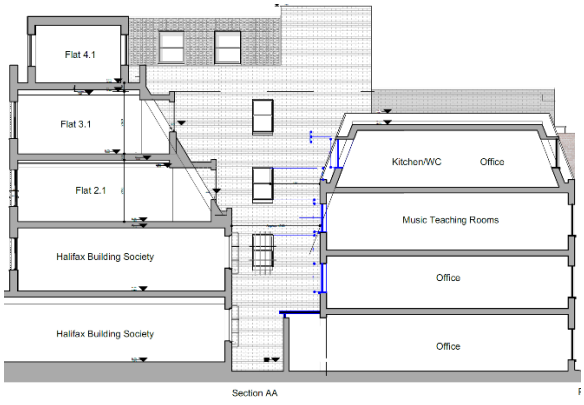
Proposed 3rd Floor (3-No Flats)

Figure 4 – Proposed 2nd and 3rd floor residential flats formed by converting existing offices

2.4.2 As part of the development, it is also proposed to build an additional floor at 4th floor level to create a single residential flat (Use Class C3). The following are extracts from the submitted drawings which also show the cross section through the building.



Propsoed 4th Floor (1-No Flats)



Section (Camden High Street on Left)

Figure 5 – Proposed new build 4th floor flat and cross section of whole development

2.4.3 The proposed flats will be exposed from traffic noise form Camden High Street and to some extent Pratt Street. The noise from the Halifax Building Society plant on the 1st floor flat roof at the front of the site will impact the front of the flats especially the flats on the 2nd floor. The music practice room on the 2nd floor at the rear of the site will impact the rear aspects of all the flats facing into the common well. However, the practice rooms are only joined to a small portion of the proposed second floor flats where it is proposed to locate a bathroom.

3 Noise Criterion

3.1 Determination of Application in line with the Local Development Plan

3.1.1 Section 38 (6) of the Planning and Compulsory Purchase Act 2004 and section 70 (2) of the Town and Country Planning Act 1990 requires the following when determining planning applications.

> *"Section 38 Development Plan*
>
> *(6) If regard is to be had to the development plan for the purpose of any determination to be made under the planning Acts the determination must be made in accordance with the plan unless material considerations indicate otherwise.*
>
> *Section 70 Determination of applications: general considerations*
>
> *(2) In dealing with an application for planning permission or permissions in principle the authority shall have regard to:*
>
> *(a) the provisions of the development plan, so far as material to the application,*
> *(c) any other material consideration."*

3.1.2 The London Plan (LP) entitled *"The Spatial Development Strategy for Greater London"* dated March 2021 includes the policies D13 and D14. The London Borough of Camden Local Plan (CLP) adopted in July 2017 includes policy A4 and Appendix 3.

A.	LP Policy D13 (London Plan) Agent of Change Principle	*(Appendix A.1.2)*
B.	LP Policy D14 (London Plan) Noise and Vibration	*(Appendix A.1.3)*
C.	CLP Policy A1 (Camden Local Plan) Impacts of Development	*(Appendix A.2.2)*
D.	CLP Policy A4 (Camden Local Plan) Noise	*(Appendix A.2.3)*
E.	CLP Appendix 3 (Camden Local Plan) Noise	*(Appendix A.2.4)*

3.2 Other Relevant Material Considerations

3.2.1 The following are material considerations when determining the current planning application which are detailed in full in Appendix A of the report.

A.1) National Planning Policy Framework last updated in December 2023 (NPPF).

A.2) Noise Policy Statement for England published in 2010 (NPSE).

A.3) Online Planning Policy Guidance – Noise updated in 2019 (PPG-N).

A.4) Other document providing guidance on LOAEL AND SOAEL.

A.5) British Standard 8233: 2014 (BS 8233).

A.6) British Standard 4142: 2014 + A1: 2019 (BS 4142).

3.3 Proposed Criterion for LOAEL

3.3.1 The initial assessment is undertaken in accordance with BS 4142 which uses the calculated specific noise levels at the assessment position and applies a feature correction to account for the specific character of the noise to determine the rating noise levels. The rating noise level is then compared against the minimum 15-minute background noise levels to determine the initial impact on future occupiers of the development.

NPSE	PPG - Noise		BS 4142 Assessment		Justification
Impact	Response	Action	Day 07:00 – 23:00	Night 23:00 – 07:00	
LOAEL	Not Intrusive	No Specific	- 0 dB (Low Impact)		A.7.26
External Sound Pressure Levels (dB) – Reference 2 x 10^{-5} watts – Uncertainty of +- 2.5 dB (95% confidence, k=2)					

Table 1 – Proposed initial external BS4142 criterion for LOAEL.

3.3.2 To ensure the proposed development complies with the Local Development Plan and all other relevant material considerations, the proposed development should ensure that the noise emissions meet the requirements for LOAEL but ideally the requirements for NOEL. The criterion has considered the context of the site, the surrounding area and the character of the individual noise sources. The criterion will ensure the noise from the Halifax Building Society plant area on the 1st floor flat roof is inaudible for the vast majority of the time for the future occupiers of the development. The criterion has been set to ensure future residents are not exposed to noise levels that are likely to cause a disturbance that could lead to a Noise Abatement Notice under the Environmental Protection Act 1990 (Amended 1993).

NPSE	PPG - Noise		Proposed Internal Noise Criterion		Justification
Impact	Response	Action	Day 07:00 – 23:00	Night 23:00 – 07:00	
NOEL	Not Intrusive	No Specific	30 dB $L_{Aeq,\ 15\ minutes}$ 50 dB $L_{Amax,\ fast}$	25 dB $L_{Aeq,\ 15\ minutes}$ 40 dB $L_{Amax,\ fast}$	A.7.26
LOAEL	Intrusive	Mitigate & Reduce	35 dB $L_{Aeq,\ 15\ minutes}$ 60 dB $L_{Amax,\ fast}$	30 dB $L_{Aeq,\ 15\ minutes}$ 45 dB $L_{Amax,\ fast}$	
External Sound Pressure Levels (dB) – Reference 2 x 10^{-5} watts – Uncertainty of +- 2.5 dB (95% confidence, k=2)					

Table 2 – Proposed internal criterion for NOEL and LOAEL based on BS 8233

3.3.3 The above criterion is based on the guidance within British Standard 8233: 2014 but following the guidance within the note of section 7.7.1 includes a 5 dB correction for the noise as it is considered to be distinctive with a character which is different to the anonymous noise sources such as traffic and activity in the local area.

3.3.4 The above criterion assumes that either the windows will be open to control over-heating within the hottest summer months or if they are closed alternative ventilation and cooling will be provided to ensure that at no time will windows need to be open to control over-heating.

4 Background Noise Measurements

4.1 Locations and Details of Measurements

4.1.1 Ambient noise and vibration measurements were undertaken on the appeal site between Saturday 3rd February and Sunday 4th February 2024 by positioning a meter adjacent to the front of the site.

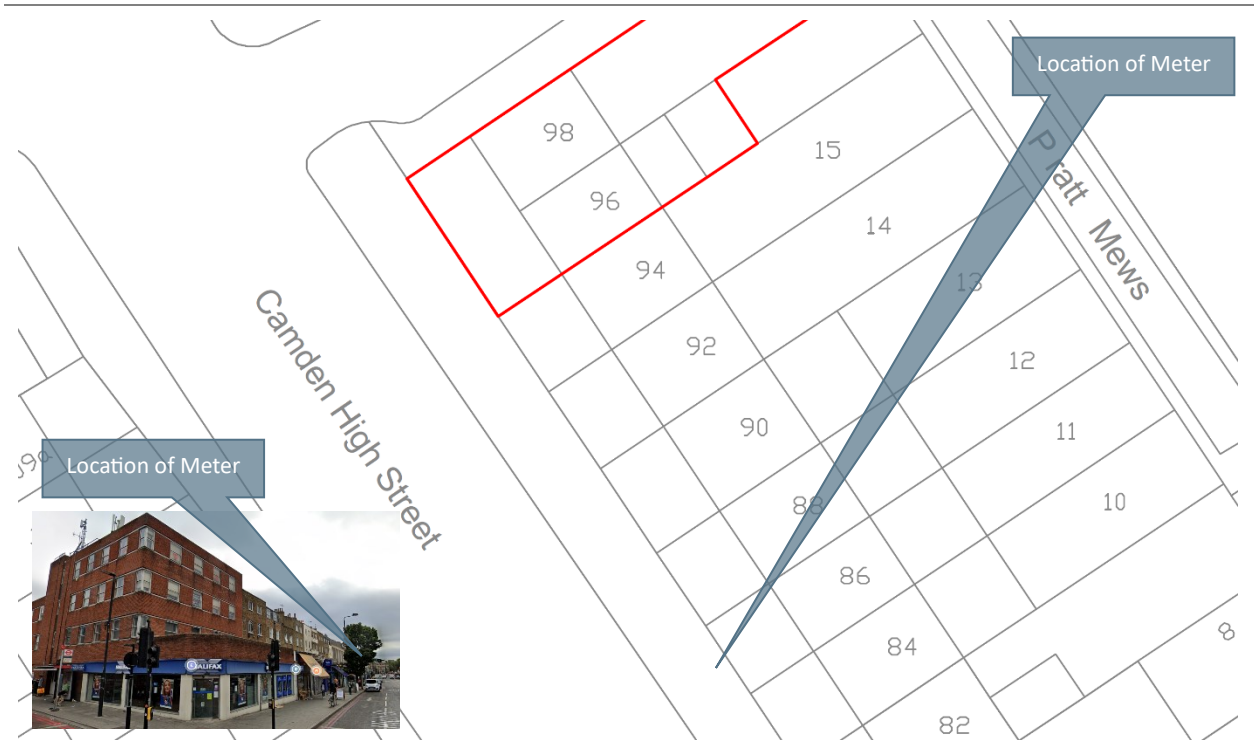


Figure 6 – Location of background noise measurements

4.2 Summary of Results from the Survey

4.2.1 Details of the weather during the survey and the calibration details of the meter are included within Appendix B of the report. The following table provides a summary of the results from the survey.

Sat 03/02/24 To Sun 04/02/24	Day (07:00 – 19:00)			Evening (19:00 – 23:00)			Night (23:00 – 07:00)		
	dB L_{Max}	dB L_{Aeq}	dB L_{A90}	dB L_{Max}	dB L_{Aeq}	dB L_{A90}	dB L_{Max}	dB L_{Aeq}	dB L_{A90}
Typical	95	72	57	88	72	57	89	70	48

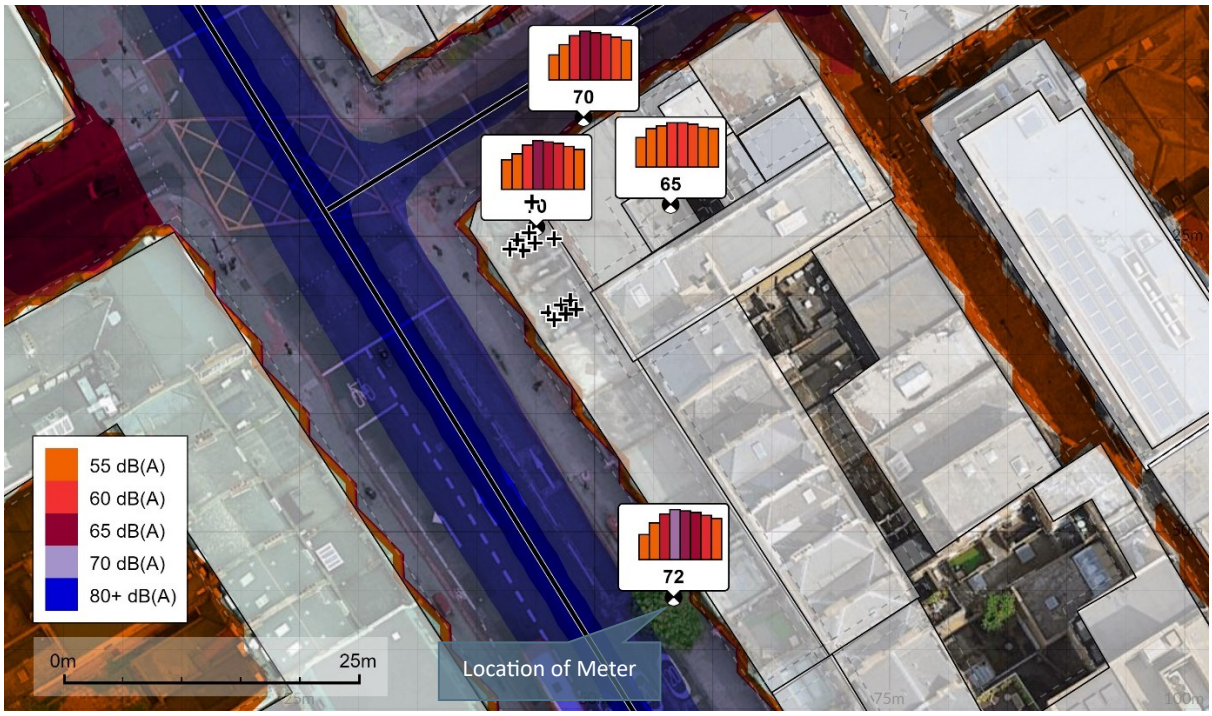
Sound Pressure Levels (dB) – Reference 2 x 10^{-5} Nm^{-2} – Uncertainty of +- 0.5 dB (95% confidence, k=2)

Table 3 – Summary of Measured Ambient and Background Noise Levels

4.2.2 The above noise levels have taken the highest 10-event maximum and average level and the lowest background noise level within each period to establish the typical ambient and background noise climate impacting the site.

4.3 3D Noise Map of Ambient Noise Survey

4.3.1 The following 3D noise map has been created to determine how the noise from general traffic on Camden High Street and Pratt Street, the Halifax 1st floor plant area and the music practice rooms at the rear of the site will impact the existing building.



Position		Octave Band Centre Frequency (Hz)			Day / Evening 07:00 – 23:00	Night 23:00 – 07:00
Ref	Description	Latitude	Longitude	Height		
BN.1	Background Measurement Position	51.536854°	-0.140626°	3.5 m	$L_{p(A)}$ 72 dB	$L_{p(A)}$ 70 dB
AC1	Mitsubishi SRC 35 ZSP-W AC Unit	51.537155°	-0.140797°	3.8 m	$L_{w(A)}$ 61 dB	$L_{w(A)}$ 60 dB
AC2	Mitsubishi SRC 35 ZSP-W AC Unit	51.537131°	-0.140801°	3.8 m	$L_{w(A)}$ 61 dB	Not Operating
AC3	Mitsubishi SRC 35 ZSP-W AC Unit	51.537126°	-0.140814°	3.8 m	$L_{w(A)}$ 61 dB	
AC4	Mitsubishi SRC 35 ZSP-W AC Unit	51.537121°	-0.140825°	3.8 m	$L_{w(A)}$ 61 dB	
AC5	Mitsubishi SRC 35 ZSP-W AC Unit	51.537119°	-0.140809°	3.8 m	$L_{w(A)}$ 61 dB	
AC6	Mitsubishi SRC 35 ZSP-W AC Unit	51.537125°	-0.140795°	3.8 m	$L_{w(A)}$ 61 dB	
AC7	Mitsubishi SRC 35 ZSP-W AC Unit	51.537128°	-0.140769°	3.8 m	$L_{w(A)}$ 61 dB	
MPR	Music Practice Room at Rear	51.537166°	-0.140565°	8.5 m	$L_{w(A)}$ 83 dB	
RT1	Road Traffic Camden High Street	51.537075°	-0.140986°	1.2m	$L_{w(A)}$ 93 dB/m	$L_{w(A)}$ 87 dB/m
RT2	Road Traffic Pratt Street	51.537260°	-0.140721°	1.2m	$L_{w(A)}$ 88 dB/m	$L_{w(A)}$ 81 dB/m

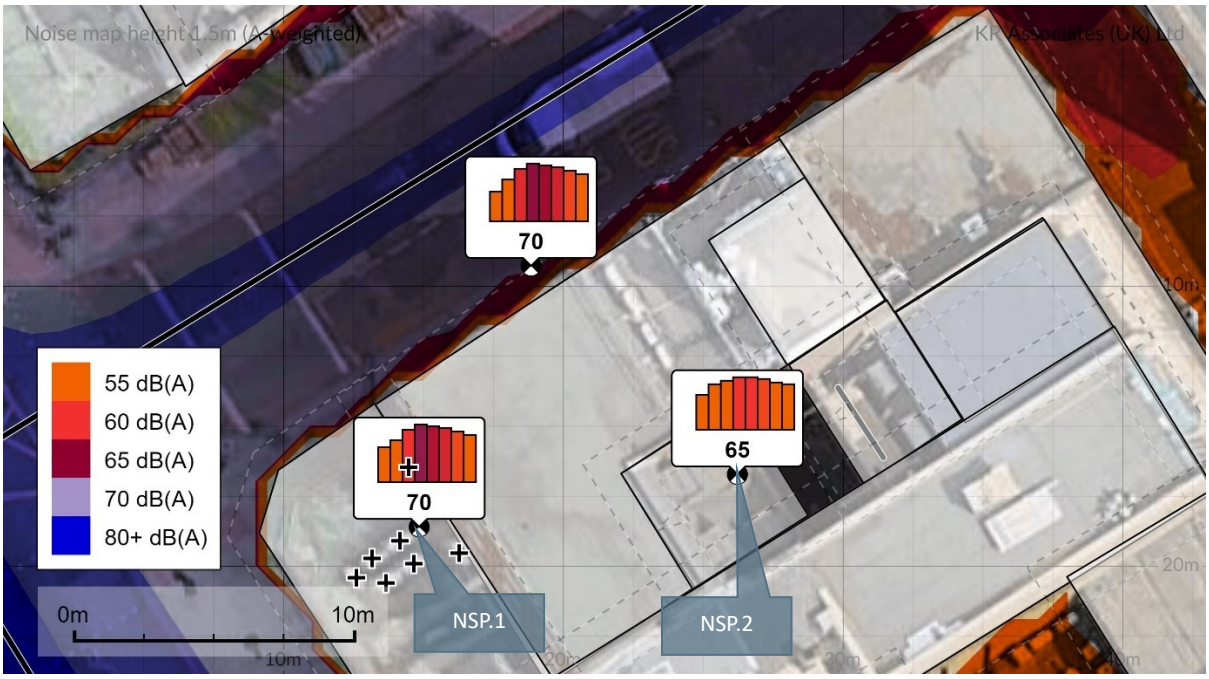
Sound Pressure Levels (dB) – Reference 2 x 10^{-5} Nm^{-2} – Uncertainty of +- 2.5 dB (95% confidence, k=2)
Sound Power Levels (dB) – Reference 1 x 10^{-12} watts – Uncertainty of +- 2.5 dB (95% confidence, k=2)

Table 4 – 3D Noise Map of Existing Site (Aligned with Ambient Noise Measurements)

5 Assessment of Noise Levels

5.1 3D Noise Map of Noise Impacting Proposed Development

5.1.1 The following shows the resultant noise levels at the most sensitive positions (NSPs) at the windows of the proposed development during the day time period between 07:00 and 23:00 hours.



Position		Octave Band Centre Frequency (Hz)			Day / Evening 07:00 – 23:00	Night 23:00 – 07:00
Ref	Description	Latitude	Longitude	Height		
NSP.1	3rd Floor Front Façade Window	51.537141°	-0.140782°	8.5 m	$L_{p(A)}$ 70 dB	$L_{p(A)}$ 68 dB
NSP.2	3rd Floor Lightwell Window	51.537135°	-0.140611°	8.5 m	$L_{p(A)}$ 65 dB	$L_{p(A)}$ 53 dB

Sound Pressure Levels (dB) – Reference 2 x 10^{-5} Nm^{-2} – Uncertainty of +- 2.5 dB (95% confidence, k=2)

Table 5 – 3D Noise Map of Existing Noise Impacting the Proposed Development

5.1.2 For the purposes of the assessment and to protect the future occupiers from all noise sources surrounding the development it is proposed to install the upgraded glazing and MVHR system to all of the habitable room windows. Therefore, the detailed assessment is only undertaken on the worst-case façade levels at the front of the development at NSP.1

5.1.3 The noise levels from the practice rooms at 14 and 15 Pratt Mews will be controlled by the existing planning conditions within permission 2011/0249/P. However, the above noise map was based on the worst-case where the windows might be open during the use of the practice rooms to control overheating.

5.2 Resultant Façade Levels

5.2.1 The following are the calculated noise levels at the noise sensitive positions within the development as a result of traffic noise on Camden High Street, Pratt Street, the Halifax Plant area on the 1st floor roof of the front of the store and the use of the practice rooms at 14 and 15 Pratt Mews.

Position	Day (07:00 – 19:00)			Evening (19:00 – 23:00)			Night (23:00 – 07:00)		
	dB L_{Max}	dB L_{Aeq}	dB L_{A90}	dB L_{Max}	dB L_{Aeq}	dB L_{A90}	dB L_{Max}	dB L_{Aeq}	dB L_{A90}
NSP.1	85	72	57	85	72	57	74	70	48
Sound Pressure Levels (dB) – Reference 2 x 10^{-5} Nm^{-2} – Uncertainty of +- 0.5 dB (95% confidence, k=2)									

Table 6 – Resultant Façade Noise Levels at the nearest Noise Sensitive Positions (NSP's)

5.3 Initial Assessment of Noise Levels to BS 4142

5.3.1 The following initial assessment is of the noise from the Halifax Building Society plant area on the 1st floor flat roof at the front of the site. The following sources levels do not include the contribution from the road traffic or other anonymous noise sources.

BS 4142: 2014 + A1: 2019 Initial Estimate		Impacts from Halifax Building Society Mechanical Services on proposed development residential dwelling		
		Day (07:00 - 19:00)	Evening (19:00 – 23:00)	Night (23:00 – 07:00)
Assessment Time Period		1 hour		15-minutes
Specific Noise Levels		48 dB $L_{Aeq,\ 1\ hour}$		42 dB $L_{Aeq,\ 1\ hour}$
Feature Correction	Tonal	+2 dB Just Perceptible	+2 dB Just Perceptible	+2 dB Just Perceptible
	Impulse	+3 dB Just Impulsive	+3 dB Just Impulsive	+3 dB Just Impulsive
	Distinctive	+0 dB Not present	+0 dB Not present	+0 dB Not present
	Intermittent	+0 dB Not present	+0 dB Not present	+0 dB Not present
Rating Noise Levels		53 dB $L_{Aeq,\ 1\ hours}$	53 dB $L_{Aeq,\ 1\ hours}$	47 dB $L_{Aeq,\ 15\ min}$
Background Noise Level		57 dB $L_{A90,\ 15\ min}$	57 dB $L_{A90,\ 15\ min}$	48 dB $L_{A90,\ 15\ min}$
Initial Assessment		-4 dB	-4 dB	-1 dB
Likely Impact Depending on Context		Significant Adverse Impact	Low Impact	Low Impact

Table 7 – BS 4142 Initial Assessment of Impact from Existing Commercial Premises

5.3.2 The initial assessment of the impacts excluding the traffic noise indicates a low impact on the future residents due to the very high background noise levels that exist at the front of the site. However, the levels do not comply with the criterion specified in the Camden Local Plan. However, within the context of the site this is likely to be acceptable if the new residential dwellings are fitted with an MVHR with additional cooling unit so that at no times throughout the year will the windows need to be opened to control over-heating.

5.4 Assessment of Internal Noise Levels with the Windows Closed

5.4.1 The following table provides a summary of the internal noise levels as a result of the existing ambient noise levels including the traffic noise and all other ambient noise sources. The detailed calculations are provided in Appendix D and assume the windows are closed, the rooms are furnished, and the ventilation system is open meeting the requirements of Approved Document F.

Internal Position (Windows Closed)	Period	Octave Band Centre Frequency (Hz)								Sum A	NR Curve
		63	125	250	500	1K	2K	4K	8K		
NSP.1 (Worst Case Levels) 3rd Floor Residential Flat	Day	41	37	39	29	16	16	19	15	32	28
	Night	39	35	37	27	14	14	17	13	30	26

Sound Pressure Levels (dB) – Reference 2 x 10^{-5} watts – Uncertainty of +- 2.5 dB (95% confidence, k=2)

Table 8 – Resultant Internal Noise Levels within the Proposed Development with the Windows Closed

5.4.2 It would appear that the mitigation measures have ensured that with the windows closed and the ventilation system open the resultant noise levels will fall below the criterion proposed for the Lowest Observed Adverse Effect Level (LOAEL).

5.5 Assessment of Internal Noise Levels with the Windows Open

5.5.1 The following table provides a summary of the internal noise levels with the windows open with an equivalent area of 0.2m^2 to control over-heating during the hotter summer months. The detailed calculations are provided in Appendix D.

Internal Position (Windows Open)	Period	Octave Band Centre Frequency (Hz)								Sum A	NR Curve
		63	125	250	500	1K	2K	4K	8K		
NSP.1 (Worst Case Levels) 3rd Floor Residential Flat	Day	43	44	48	45	41	35	32	30	46	41
	Night	41	42	46	43	39	33	30	28	44	39

Sound Pressure Levels (dB) – Reference 2 x 10^{-5} watts – Uncertainty of +- 2.5 dB (95% confidence, k=2)

Table 9 – Resulted Internal Noise Levels within the Proposed Development with the Windows Open

6 Conclusions and Discussions

6.1 Proposed Acoustic Measures

6.1.1 It would be recommended that the development of the residential dwelling at the application site includes the following minimum mitigation measures to ensure compliance with the Local Development Plan and all other relevant material considerations.

a) Acoustic glazing with a minimum performance or R_w 40 dB e.g. 6.8mm – 12mm argon filled airgap – 6.0mm toughened. Manufacturer to provide verified test certificate. Total thickness of 25mm.
b) No trickle type vents within the façade of the building.
c) MVHR whole house ventilation system with additional cooling or design to ensure windows do not need to be opened to control over-heating. The system will need to provide an over performance of R_w 45 dB or more which could be achieved with standard 1,800mm long attenuators.
d) Additional cooling unit to the MVHR ventilation system to ensure that windows never need to be opened to control over-heating.

6.2 Conclusion

6.2.1 The proposed mitigation measures will ensure that the proposed development gives rise to acceptable noise levels for future residents and does not have a detrimental impact on the existing operation of the Halifax Building Society on the ground and 1st floor of the development site or the music practice rooms at 14 and 15 Pratt Mews. The proposed development complies with the relevant parts of the Local Development Plan (Policies A1 and A4) and all other relevant material considerations.

6.2.2 The proposed development also fully complies with the specific criterion included within Appendix 3 of the Camden Local Plan. This requires the average noise levels not to exceed 35 dB $L_{Aeq,\ 16\ hours}$ during the day time and 30 dB $L_{Aeq,\ 8\ hours}$ during the night time and maximum noise level not to exceed 42 dB $L_{Amax,\ fast}$ during the night time to ensure the levels are rated "Green" and fall below the Lowest Observed Effect Level (LOEL).

6.3 Discussions

6.3.1 The glazing performance has been calculated using the Insul software assuming the following makeup with an overall performance of R_w (C; C_{tr}) of 40 (-2; -6) dB.

a) 6.7mm PVB standard laminated glass (Surface mass 15.4 Kgm^{-2}, critical frequency 2,246 Hz).
b) 12mm argon filled airgap (F_0 197 Hz)
c) 6.0mm toughened glass (Surface mass 14.6 Kgm^{-2}, critical frequency 2,332 Hz).

End of Main Body of Report

A Appendix A – Relevant Material Considerations

A.1 London Plan Policy D13 and D14

A.1.1 The London Plan entitled *"The Spatial Development Strategy for Greater London"* dated March 2021 includes the following two policies which relate to noise.

A.1.2 Policy D13 relates to the *"Agent of Change"* principle and places the responsibility on the current development to ensure undue pressure is not placed on existing commercial premises.

> *"Policy D13 Agent of Change*
>
> *A. The Agent of Change principle places the responsibility for mitigating impacts from existing noise and other nuisance-generating activities or uses on the proposed new noise-sensitive development. Boroughs should ensure that Development Plans and planning decisions reflect the Agent of Change principle and take account of existing noise and other nuisance-generating uses in a sensitive manner when new development is proposed nearby.*
>
> *B. Development should be designed to ensure that established noise and other nuisance-generating uses remain viable and can continue or grow without unreasonable restrictions being placed on them.*
>
> *C. New noise and other nuisance-generating development proposed close to residential and other noise-sensitive uses should put in place measures to mitigate and manage any noise impacts for neighbouring residents and businesses.*
>
> *D. Development proposals should manage noise and other potential nuisances by:*
>
> *1. ensuring good design mitigates and minimises existing and potential nuisances generated by existing uses and activities located in the area.*
>
> *2. exploring mitigation measures early in the design stage, with necessary and appropriate provisions including ongoing and future management of mitigation measures secured through planning obligations.*
>
> *3. separating new noise-sensitive development where possible from existing noise-generating businesses and uses through distance, screening, internal layout, soundproofing, insulation and other acoustic design measures.*
>
> E. *Boroughs should not normally permit development proposals that have not clearly demonstrated how noise and other nuisances will be mitigated and managed."*

A.1.3 Policy D14 details how noise should be considered in terms of the proposed development both in terms of its impact on the surrounding area and the impact of existing noise on the future occupants of the development.

> *''Policy D14 – Noise*
>
> *A. In order to reduce, manage and mitigate noise to improve health and quality of life, residential and other non-aviation development proposals should manage noise by:*

1. *avoiding significant adverse noise impacts on health and quality of life*
2. *reflecting the Agent of Change principle as set out in Policy D13 Agent of Change*
3. *reflecting the Agent of Change principle as set out in Policy D13 Agent of Change*
4. *improving and enhancing the acoustic environment and promoting appropriate soundscapes (including Quiet Areas and spaces of relative tranquillity)*
5. *separating new noise-sensitive development from major noise sources (such as road, rail, air transport and some types of industrial use) through the use of distance, screening, layout, orientation, uses and materials – in preference to sole reliance on sound insulation.*
6. *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 applying good acoustic design principles.*
7. *promoting new technologies and improved practices to reduce noise at source, and on the transmission path from source to receiver.*

B. *Boroughs, and others with relevant responsibilities, should identify and nominate new Quiet Areas and protect existing Quiet Areas in line with the procedure in Defra's Noise Action Plan for Agglomerations.''*

A.2 London Borough of Camden Development Plan Policy A1 and A4

A.2.1 The London Borough of Camden Development Management Local Plan was fully adopted in July 2017 and includes the following policies relating to noise.

A.2.2 Policy A1 entitled *"Managing the Impacts of Development"* requires the following from any proposed development in terms of noise and vibration:

"The Council will seek to protect the quality of life of occupiers and neighbours. We will grant permission for development unless this causes unacceptable harm to amenity.

We will:

a) seek to ensure that the amenity of communities, occupiers and neighbours is protected;
b) seek to ensure development contributes towards strong and successful communities by balancing the needs of development with the needs and characteristics of local areas and communities;
c) resist development that fails to adequately assess and address transport impacts affecting communities, occupiers, neighbours and the existing transport network; and
d) require mitigation measures where necessary.

The factors we will consider include:

j) noise and vibration levels;''

A.2.3 Policy A4 entitled *"Noise and Vibration"* provides the following specific advice in terms of the impacts of noise and vibration:

> *"The Council will seek to ensure that noise and vibration is controlled and managed.*
>
> *Development should have regard to Camden's Noise and Vibration Thresholds (Appendix 3). We will not grant planning permission for:*
>
> *a) development likely to generate unacceptable noise and vibration impacts; or;*
> *b) development sensitive to noise in locations which experience high levels of noise, unless appropriate attenuation measures can be provided and will not harm the continued operation of existing uses.*
>
> *We will only grant permission for noise generating development, including any plant and machinery, if it can be operated without causing harm to amenity. We will also seek to minimise the impact on local amenity from deliveries and from the demolition and construction phases of development.''*

A.2.4 Further guidance on the acceptable thresholds for noise are contained within Appendix 3 of the Camden Local Plan within the section entitled *"Proposed developments likely to be Sensitive to Noise"*.

> *"Special consideration will need to be given to noise sensitive developments that are proposed in areas which are, or expected to become, subject to levels of noise likely to have an adverse effect. The threshold of acceptability of the noise will primarily depend on two factors: the intended use of the noise sensitive development and the source of the noise experienced, or likely to be experienced."*

A.2.5 Appendix 3 provides the following noise criteria for anonymous noise sources such as the road traffic noise from Camden High Street.

Assessment Location	Design Period	LOAEL (Green)	LOAEL to SOAEL (Amber)	SOAEL (Red)
Inside Bedroom	Day	< 35 dB $L_{Aeq, 16h}$	35 dB to 45 dB $L_{Aeq, 16h}$	> 45 dB $L_{Aeq, 16h}$
	Night	< 30 dB $L_{Aeq, 16h}$	30 dB to 40 dB $L_{Aeq, 16h}$	> 40 dB $L_{Aeq, 16h}$
		< 42 dB $L_{Amax,fast}$	42 dB to 73 dB $L_{Amax,fast}$	> 73 dB $L_{Amax,fast}$
Outside Bedroom Window (Façade)	Day and Night	< -10 dB Assessment	-9 dB to +5 dB Assessment	> +5 dB Assessment
	Night	< 57 dB $L_{Amax,fast}$	57 dB to 88 dB $L_{Amax,fast}$	> 88 dB $L_{Amax,fast}$

Table 10 – Camden Appendix 3 criterion for anonymous noise and noise with character

A.3 National Planning Policy Framework: 2023 (NPPF)

A.3.1 The National Planning Policy Framework: 2023 (NPPF) sets out the Government's planning policies and how these should be applied and provides a framework within which local prepared plans for housing and other developments can be produced. The NPPF is considered a material consideration when determining planning applications.

A.3.2 The core principle of the NPPF is the presumption in favour of sustainable development and provides a balance between the benefits of the development against any significant adverse impacts.

> *"2. Plans and decision should apply a presumption in favour of sustainable development.*
> *For decision-taking this means:*
>
> > *c) approving development proposals that accord with an up-to-date development plant without delay…"*

A.3.3 Section 15 of the NPPF entitled *"Conserving and enhancing the natural environment"* provides the following advice at paragraph 180.

> *"180. Planning policies and decisions should contribute to and enhance the natural and local environment.*
>
> > *e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of …noise pollution."*

A.3.4 Further advice on noise is provided at Paragraph 191 under the title *"Pollution".*

> *"191. 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 impact resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life[65]."*

A.3.5 Note 65 within section a) of paragraph 191 of the NPPF refers to the Noise Policy Statement for England dated 2010.

A.4 Noise Policy Statement for England: 2010 (NPSE)

A.4.1 Defra published its document entitled *"Noise Policy Statement for England"* in March 2010 (NPSE) to clarify the long term *"Noise Policy Vision"* which is detailed in paragraph 1.6.

> *"1.6 Promote good health and a good quality of life through the effective management of noise within the context of Government Policy on sustainable development."*

A.4.2 The NPSE provides the following aims on the management and control of environmental noise at section 1.7:

> *"- 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."*

A.4.3 The NPSE provides a useful definition of the lowest and significant adverse effect levels at paragraphs 2.20 and 2.21, respectively.

> *"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.*
>
> *SOAEL – Significant Observed Adverse Effect Level This is the level above which significant adverse effects on health and quality of life occur."*

A.5 Planning Policy Guidance (Noise) PPG: 2019 (PPG-N)

A.5.1 The Ministry of Housing, Communities and Local Government last updated its online guidance on noise entitled *"Noise - Advice on how planning can manage potential noise impacts in new development"* in July 2019 (PPG) and enhances the guidance within the NPPF and NPSE providing the following outline advice in paragraph 001.

> *"Noise needs to be considered when development may create additional noise or would be sensitive to the prevailing acoustic environment (including any anticipated changes to that environment from activities that are permitted but not yet commenced). When preparing plans, or taking decisions about new development, there may also be opportunities to make improvements to the acoustic environment. Good acoustic design needs to be considered early in the planning process to ensure that the most appropriate and cost-effective solutions are identified from the outset."*

A.5.2 Paragraph 005 of the PPG provides useful guidance on the noise exposure hierarchy based on the response of residential occupiers of dwellings.

Response	Details of Outcomes	Action
No Observed Adverse Effect Level (NOEL)		
Not Intrusive	Noise can be heard, but does not cause any change in behaviour, attitude, or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.	No Specific Measures
Lowest Observed Adverse Effect Level (LOAEL)		
Intrusive	Noise can be heard and causes small changes in behaviour, attitude, or other physiological response, 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. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.	Mitigate and Reduce
Significant Observed Adverse Effect Level (SOAEL)		
Disruptive	The noise causes a material change in behaviour, attitude, or other physiological response, 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	Avoid
Very Disruptive	The noise causes a material change in behaviour, attitude, or other physiological response, 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	Prevent

Table 11 – Policy Planning Guidance (Noise) – Noise exposure hierarchy table.

A.6 Other Documents providing guidance on LOAEL and SOAEL

A.6.1 Aecom were commissioned by Defra to produce a document entitled *"Possible Options for the Identification of SOAEL and LOAEL in Support of NPSE"* under reference NANR 316 which was published in 2015. Table 1.1 entitled *"Summary of Outcomes"* provides an indication of numerical values for NOEL and SOAEL for various sources.

Source	Annoyance 07:00 to 23:00		Sleep Disturbance 23:00 to 07:00	
	LOAEL	SOAEL	LOAEL	SOAEL
Road	56 dB $L_{Aeq,\ 16\ hours}$	66 dB $L_{Aeq,\ 16\ hours}$	46 $L_{Aeq,\ 8\ hours}$	56 $L_{Aeq,\ 8\ hours}$
Rail	63 dB $L_{Aeq,\ 16\ hours}$	72 dB $L_{Aeq,\ 16\ hours}$	55 $L_{Aeq,\ 8\ hours}$	68 $L_{Aeq,\ 8\ hours}$
Air	52 dB $L_{Aeq,\ 16\ hours}$	60 dB $L_{Aeq,\ 16\ hours}$	41 $L_{Aeq,\ 8\ hours}$	53 $L_{Aeq,\ 8\ hours}$

Table 12 – Summary of Aecom - Identification of SOAEL and LOAEL in support of NPSE dated 2015.

A.6.2 During the planning for the High Speed 2 rail link (HS2) the factsheet entitled *"HS2 - Control of Airborne Noise"* version 3.0 dated June 2019 was produced which provided the following clarification of the absolute noise levels for LOAEL and SOAEL. Table 1 in Appendix B provided the *"Operational airborne noise impact and effects levels from altered roads and operational railway"*.

Source	Annoyance Day Time 07:00 to 23:00		Sleep Disturbance Night Time 23:00 to 07:00	
	LOAEL	SOAEL	LOAEL	SOAEL
Road and Rail	50 dB $L_{Aeq, 16\ hours}$	65 dB $L_{Aeq, 16\ hours}$	40 dB $L_{Aeq, 8\ hours}$	55 dB $L_{Aeq, 8\ hours}$
			60 dB L_{AFMax}	80 dB L_{AFMax}

Table 13 – Summary of HS2 Control of Airborne Noise version 3.0 (LOAEL and SOAEL: 2019

A.6.3 The World Health Organisation published a document entitled *"Guidelines for Community Noise"* in 1999 which included the following guideline values in Table 1 entitled *"Guidelines values for community noise in specific environments"*.

Environment		$L_{Aeq,t}$	$L_{AMaxfast}$
Inside Dwelling	Moderate annoyance daytime and evening	35 dB $L_{Aeq, 8\ hours}$	--
	Bedrooms sleep disturbance night-time	30 dB $L_{Aeq, 8\ hours}$	45 dB L_{AFMax}
Outside	Bedrooms sleep disturbance (window open)	45 dB $L_{Aeq, 8\ hours}$	60 dB L_{AFMax}

Table 14 – Summary of WHO Guidelines for Community Noise Table 1: 1999

A.6.4 The World Health Organisation then published another document entitled *"Night Noise Guidelines for Europe"* in 2009. Table 3 within the summary of the document entitled *"Effects of different levels of night noise on the populations health"* provides useful guidance on the NOEL and SOAEL thresholds.

Effect Level	Health Effects on Population	$L_{night, outside}$
NOEL	No substantial observed biological effects	30 dB $L_{Aeq, 8\ hours}$
SOAEL	Situation considered increasingly dangerous for public health	above 55 dB $L_{Aeq, 8\ hours}$

Table 15 – Summary of WHO / EU Night Noise Guidelines for Europe: 2009

A.6.5 The World Health Organisation then published a document entitled "*Environmental Nosie Guidelines for the European Region – Executive Summary"* in 2018.

Source	Annoyance Day Time 07:00 to 23:00	Sleep Disturbance Night Time 23:00 to 07:00
Road	53 dB $L_{Aeq, 16\ hours}$	45 dB $L_{Aeq, 8\ hours}$

Table 16 – Summary of WHO Environmental Noise Guidelines for Europe: 2018

A.6.6 British Standard 389: Part 7: 2019 entitled *"Acoustics: Reference zero for the calibration of audiometric equipment. Reference threshold of hearing under free-field and diffuse-field listening conditions"* provides the threshold at which noise is likely to be inaudible for a young healthy adult.

Noise Source	Octave Band Centre Frequency (Hz)								Sum A	NR Curve
	63	125	250	500	1K	2K	4K	8K		
1st Floor Bedroom	45	28	17	10	8	6	5	2	21	12
Sound Pressure Levels (dB) – Reference 2 x 10^{-5} watts – Uncertainty of +- 2.5 dB (95% confidence, k=2)										

Table 17 – Summary of BS 389 for Threshold of Hearing: 2019

A.6.7 Napier University produced a document under reference NANR 116 entitled *"Open / Closed Window Research – Sound Insulation through ventilated domestic windows"* in April 2007. The document provided the estimated performance of a partially open window with an area of 0.2 m^2 in table 5-6 entitled *"Statistically Derived Dn,e insulation ratings for window openings (dB)"*. However, if you apply the principles of British Standard 12354 – Part 3 entitled *"Building acoustics. Estimation of acoustic performance of buildings from the performance of elements – Airborne Sound"* you can estimate the performance of an open window with an area of 1.5 m^2.

Noise Source	Octave Band Centre Frequency (Hz)								ΔSum A	R_w
	63	125	250	500	1K	2K	4K	8K		
Partially Open Window (0.2 m^2)	20	14	14	16	14	17	19	20	19	16
Fully Open Window (1.5 m^2)	5	6	7	7	7	7	7	7	5	8
Transmission Loss (dB)										

Table 18 – Summary of Napier University NANR 116 Open Closed Windows: 2007

A.6.8 We can therefore use the threshold of hearing and the worst-case performance of an open window derived from the methodology within BS 12354 – Part 3 to determine the No Observed Adverse Effect Level (NOEL) externally from any bedroom window.

Position	Octave Band Centre Frequency (Hz)								Sum A	NR
	63	125	250	500	1K	2K	4K	8K		
External from Habitable Room	50	34	24	17	15	13	12	9	26	18

Table 19 – Estimation External Levels for NOEL based on Open Window and Threshold of Hearing

A.7 British Standard 8233: 2014 (BS 8233)

A.7.1 British Standard 8233: 2014 entitled *"Guidance on sound insulation and noise reduction for buildings"* provides some useful criterion for internal noise levels within dwellings within section 7.7.2 entitled *"Internal ambient noise levels for dwellings"*. (CD12.5). ProPG provides a criterion for the maximum internal noise (L_{AMax}) during the night time period in figure 2 in section 2.27 (CD12.3).

Area of Development	Day Time (07:00 to 23:00)	Night Time (23:00 to 07:00)
Resting Living Room	35 dB $L_{Aeq, 16\ hours}$	--
Sleeping Bedroom	35 dB $L_{Aeq, 16\ hours}$	30 dB $L_{Aeq, 8\ hours}$
		45 dB $L_{Amax, 10\text{-}event}$
External Amenity Area	55 dB $L_{Aeq, 16\ hours}$	--

Table 20 – Table 4 of British Standard 8233: 2014 – Residential noise criterion for noise without character

A.7.2 It should be noted that the criterion is based on sources without character as detailed in paragraph 7.7.1 .

> *"This subclause applies to external noise as it affects the internal acoustic environment from sources without a specific character, previously termed "anonymous noise." Occupants are usually more tolerant of noise without a specific character than, for example, that from neighbours which can trigger complex emotional reactions. For simplicity, only noise without character is considered in Table 4.*
>
> *NOTE Noise has a specific character if it contains features such as a distinguishable, discrete and continuous tone, is irregular enough to attract attention, or has strong low-frequency content, in which case lower noise limits might be appropriate."*

A.7.3 BS8233 provides the following advice for the assessment of industrial noise, which is often considered to have a specific character in section 6.5.2 entitled *"Assessment of Industrial Noise".*

> *"Where industrial noise affects residential or mixed residential areas, the methods for rating the noise in BS 4142 should be applied. BS 4142 describes methods for determining, at the outside of a building:*
>
> *a) noise levels from factories, industrial premises or fixed installations, or sources of an industrial nature in commercial premises; and*
>
> *b) background noise level."*

A.7.4 It is therefore considered appropriate to apply a correction to the criterion within BS 8233 to account for the character of the noise from the proposed development to establish a suitable level of LOAEL and SOAEL.

A.8 British Standard 4142: 2014 + A1: 2019 (BS 4142)

A.8.1 British Standard 4142: 2014 + A1: 2019 entitled *"Methods for rating and assessing industrial and commercial sound"* provides a methodology to determine the impact of industrial noise on occupiers of residential dwellings. The overall scope of the standard is clarified in the last paragraph of section 1.1.

> *"The methods described in this British Standard use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident."*

A.8.2 The 2019 amendment to the standard added the following clarification that it is not designed as a methodology to assess internal noise levels within residential dwellings from industrial sources.

> *"The methodology set out in Clauses 7, 8, and 9 of this standard is not intended to be used to assess the extent of the impact at indoor locations. Internal sound levels can be taken into account as outlined in Clause 11.*
>
> *The standard is not intended to be applied to the assessment of indoor sound levels."*

A.8.3 The assessment methodology uses the calculated specific noise levels at the assessment position and applies a feature correction to account for the specific character of the noise to determine the rating noise levels. The rating noise level is then compared against the underlying background noise levels. The assessment of the results is defined within the commentary of section 11 entitled *"Assessment of the Impacts*".

"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.

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."

A.9 Proposed Noise Criterion

A.9.1 The initial assessment of the impact of the commercial noise on the future occupiers of the development who may be inside or outside of the building is based on the noise impacting the façade of the building. The assessment is undertaken in general accordance with BS 4142.

A.9.2 To allow for the context of the site, the following criterion is based on the documents detailed in Appendix A.1 to A.6 which are considered appropriate material consideration in determining the application.

NPSE	PPG - Noise		Proposed Noise Criterion		Justification
Impact	Response	Action	Day 07:00 – 23:00	Night 23:00 – 07:00	
NOEL	Not Intrusive	No Specific	30 dB $L_{Aeq, 15\ minutes}$	25 dB $L_{Aeq, 15\ minutes}$	A.7.26
LOAEL	Intrusive	Mitigate & Reduce	35 dB $L_{Aeq, 15\ minutes}$	30 dB $L_{Aeq, 15\ minutes}$	
SOAEL	Disruptive	Avoid	50 dB $L_{Aeq, 15\ minutes}$	45 dB $L_{Aeq, 15\ minutes}$	
	Very Disruptive	Prevent			
External Sound Pressure Levels (dB) – Reference 2 x 10^{-5} watts – Uncertainty of +- 2.5 dB (95% confidence, k=2)					

Table 21 – Proposed Noise Criterion for NOEL, LOAEL and SOAEL for the proposed development Site

A.9.3 The No Observed Adverse Effect Level (NOEL) is determined by taking the threshold of hearing from BS 389 and assuming the person is located internally within a habitable room with the window fully open offering a level difference of 5 dB (A) from inside to outside calculated in accordance with BS 12354 – Part 3.

B Appendix B - Background Noise Measurement Details…

B.1 Calibration Details

B.1.1 The following equipment was used for the measurement of the background noise levels and was calibrated by Campbell Associates Ltd which holds a current scope of accreditation from the United Kingdom Accreditation Service (UKAS). The calibration certificates are held on file and are available upon request.

KRE/020	Sound Level Meter	Microphone	Calibrator
Manufacturer	Casella Instruments		
Model Number	CEL-633C1	CEL-251	CEL-120/1
Serial Number	2425448	00092	5230902
Calibration Laboratory	Campbell Associates Ltd – UKAS Calibration Laboratory Number 0789		
Calibration Standard	BS IEC 61672 – Part 1: 2003 Class 1 as modified by UKAS TPS 49 Edition 2: 2009		
Calibration Certificate	U42920	42919	U46420
Calibration Due	10th January 2025	10th January 2025	11th January 2025

Table 22 – Calibration Details of Meter(s) used for Ambient and Background Noise Measurements

B.2 Weather Conditions During Survey

B.2.1 The wind speed and rainfall during the survey did not have an impact on the measurement results. During the survey, the day time temperature was around 13°C, and over-night dropped to around 3°C. There was no precipitation during the measurement period.

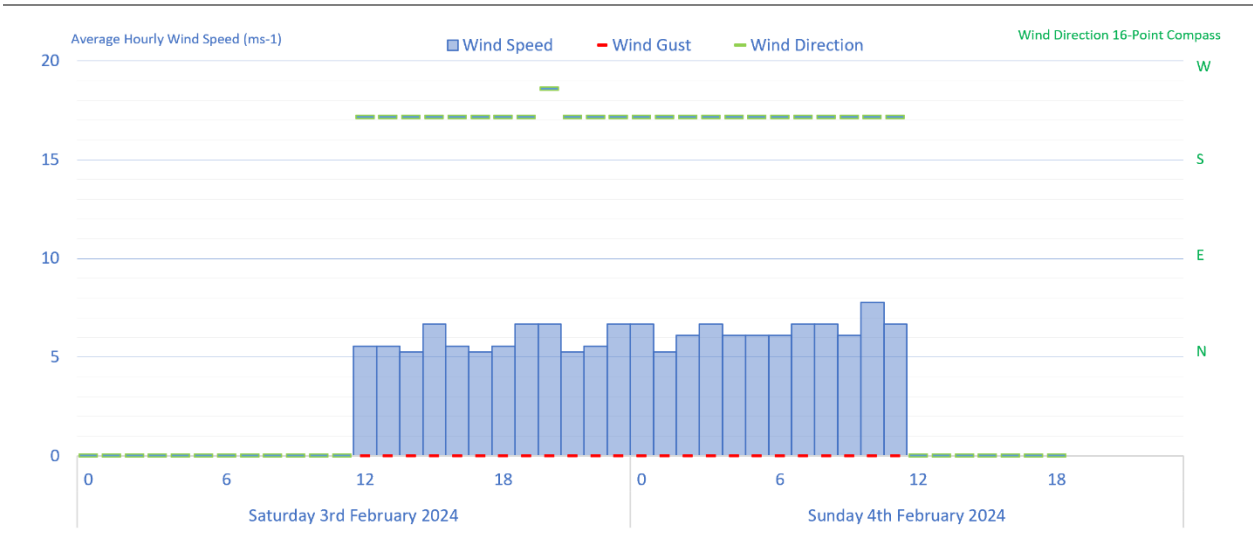


Figure 7 – Hourly Wind Speed and Direction

B.3 5-minute Measurement Profile

B.3.1 The following graph shows the 5-minute 10-event maximum ($L_{AMax,fast}$), average ambient levels ($L_{Aeq,\ 5\ minutes}$) and the background noise level ($L_{A90,\ 5\ minutes}$) during the survey period.

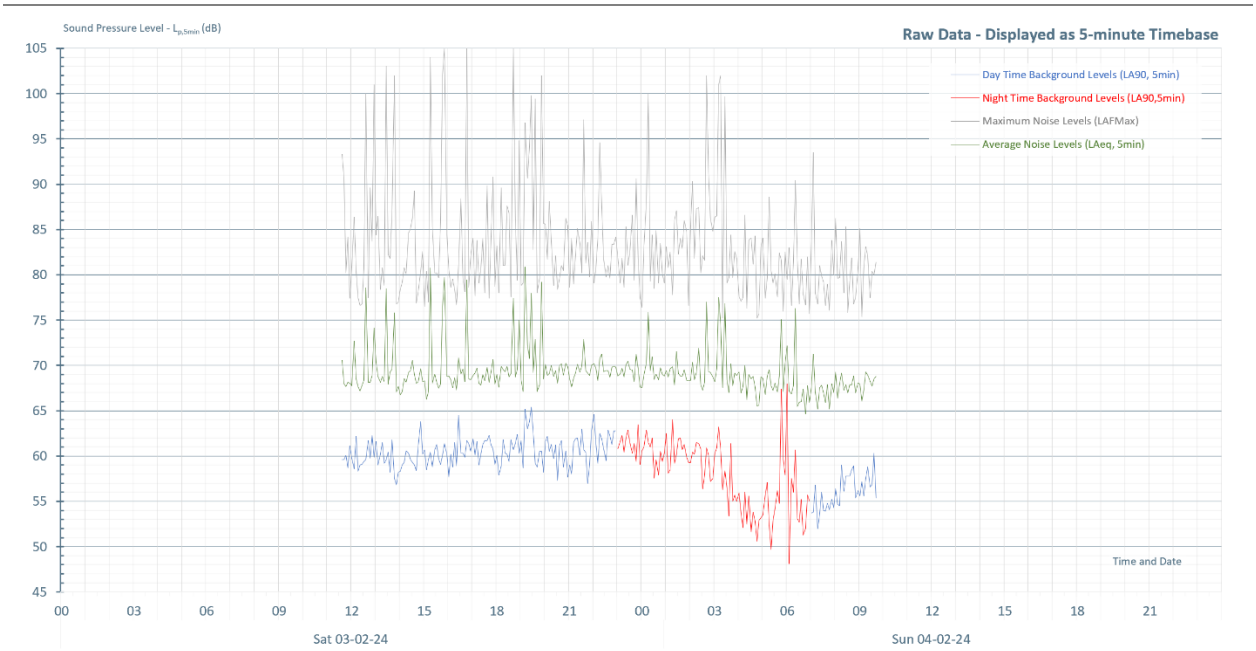


Figure 8 – 5-minute data of Maximum, Ambient and Background Noise Levels

B.3.2 The following graph breaks down the above data into the day time (07:00 to 19:00), evening (19:00 to 23:00) and night time periods (23:00 to 07:00) hours.

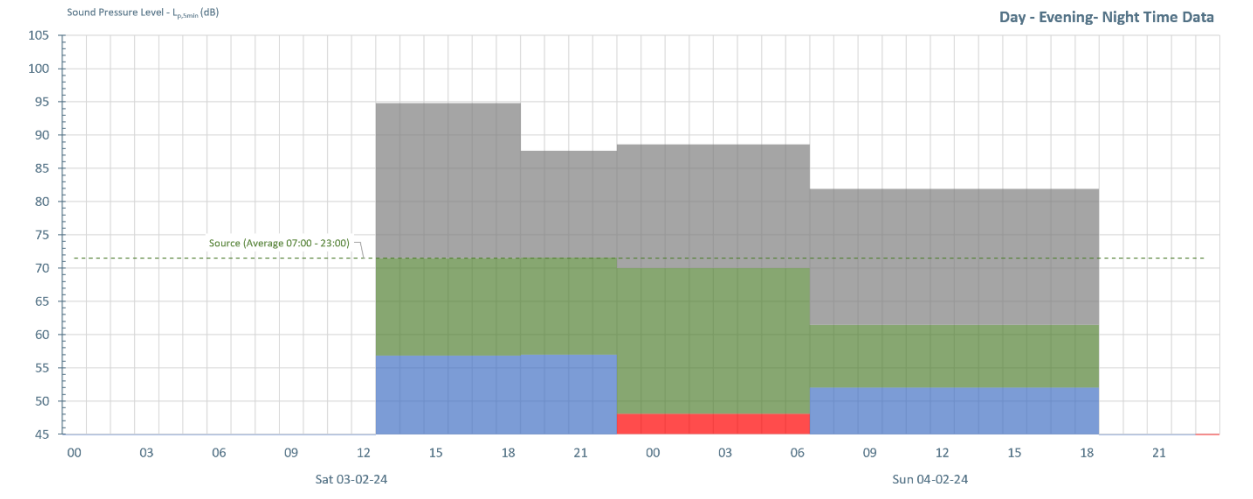


Figure 9 – Resultant Day, Evening and Night Time Levels

B.4 Derived Levels for the Calculations

B.4.1 The following table summarises the levels recorded at the background measurement position.

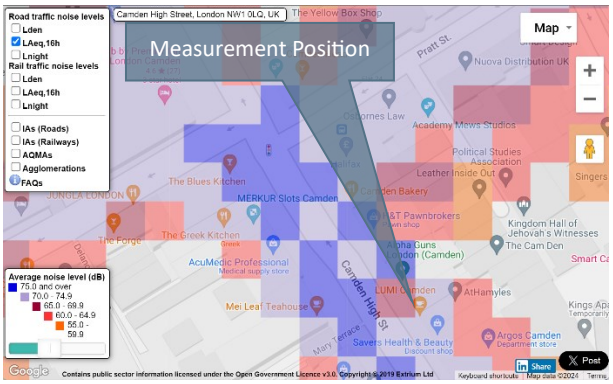
Date	Day (07:00 – 19:00)			Evening (19:00 – 23:00)			Night (23:00 – 07:00)		
	dB L_{Max}	dB L_{Aeq}	dB L_{A90}	dB L_{Max}	dB L_{Aeq}	dB L_{A90}	dB L_{Max}	dB L_{Aeq}	dB L_{A90}
Sat 03/02/24	95	72	57	88	72	57	89	70	48
Sun 04/02/24	82	61	52	--	--	--	--	--	--
Typical	95	72	57	88	72	57	89	70	48

Sound Pressure Levels (dB) – Reference 2 x 10^{-5} Nm^{-2} – Uncertainty of +- 0.5 dB (95% confidence, k=2)

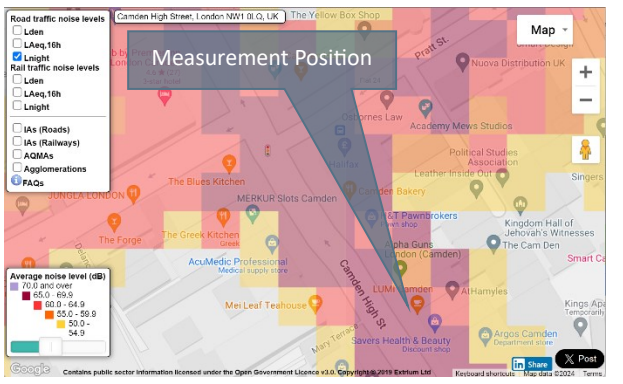
Table 23 – Derived Table of Maximum, Ambient and Background Noise Levels for Day, Evening and Night Time

B.5 Strategic Noise Maps for Day and Night Time

B.5.1 The following table shows an extract from the Strategic Noise Maps for England and are based on the traffic flows produced by the Department for Transport. These noise maps are calculated on a 10m x 10m grid and only account for the road traffic noise from Camden High Street and Pratt Street which runs up the side of the site.



Day Time (07:00 – 23:00): 70 – 75 dB $L_{Aeq,\ 16\ hours}$



Night Time (23:00 – 07:00): 65 – 70 dB $L_{Aeq,\ 16\ hours}$

Figure 10 – Extract from Strategic Noise Maps (Extrium) for Day and Night Levels from Leigh High Road.

B.5.2 The measurements undertaken on a Saturday and Sunday are considered to be representative of the worst-case noise levels that are likely to exist on Camden High Street.

C Appendix C - Manufacturers Data…

C.1 AC1 to AC 7 – Mitsubishi SRC 35 ZSP-W Single Fan AC Heat Pump

C.1.1 The Mitsubishi Heavy Industries unit is a single-phase AC heat pump with a single 0.75 kw compressor and a single fan moving 30 m^3hour^{-1} of air horizontally. The unit provides a nominal cooling capacity of 3.2 kW and nominal heating capacity of 3.6 kW.

Ref	Description	Nominal Dimensions			Parallelepiped Surface	
		Width	Depth	Height	At 1m	At 10m
C.2	Mitsubishi SRC 35 ZSP-W AC Unit	0.66 m	0.28 m	0.54 m	21.31 m^2	1,282 m^2

C.1.2 The following A-Weighted data has been calculated using the formula within Annex D of British Standard 13487: 2010 entitled *"Heat exchanger. Forced convection air cooled refrigerant condensers and dry coolers. Sound Measurement."*

Ref	Proposed Development Noise Source	Operating Times of Unit			Position of Unit	
		Day	Evening	Night	Latitude	Longitude
C.2	Sound Power Level, $L_{w(A)}$	$L_{w(A)}$ 61 dB	$L_{w(A)}$ 61 dB	Turned Off	51.461164°	-0.005606°
	Sound Pressure Level at 1m, $L_{p,1m}$	48 dB	48 dB			
	Sound Pressure Level at 10m, $L_{p,10m}$	30 dB	30 dB			

C.1.3 The following are the octave band sound power levels of the unit from the manufacturer's website.

Noise Source		Octave Band Centre Frequency (Hz)								Sum A	NR Curve
Ref	Operating Times	63	125	250	500	1K	2K	4K	8K		
C.2.D	Day & Evening (07:00 to 23:00)	78	63	59	59	56	50	43	34	61	56
C.2.N	Night (23:00 to 07:00)	Unit turned off during this period									

Sound Power Levels (dB) – Reference 1 x 10^{-12} watts – Uncertainty of +- 2.5 dB (95% confidence, k=2)

C.1.4 The manufacturers data has been taken from the Toshiba website. It has been assumed that the data has been correctly obtained using a recognised testing standard. It is assumed that the unit located on site has been installed, operated and maintained as per the manufacturer's instructions.

D Appendix D – Detailed Calculations of Internal Noise Levels

D.1 Day Time (07:00 to 23:00) Habitable Room (Windows Closed)

D.1.1 The following is a summary of the main elements of the construction required within the proposed residential flats.

Ref	Element of Facade	Octave Band Centre Frequency (Hz)								Sum A	R_w
		63	125	250	500	1K	2K	4K	8K		
D1.B	Ventilation (MVHR)	28	31	34	43	49	46	41	(35)	--	45
D1.C	Window Closed - Glazing	26	27	26	36	44	45	49	(50)	--	40
D1.D	Façade Construction	51	57	58	62	70	70	72	(72)	--	57
D1.E	Ceiling of Room (Internal)	--	--	--	--	--	--	--	--	--	--
Sound Power Levels (dB) – Reference 1 x 10^{-12} watts – Uncertainty of +- 2.5 dB (95% confidence, k=2)											

D.1.2 The following calculations provides an estimate of the internal noise levels within the windows closed and the windows open to provide ventilation in line with the requirements of Approved Document F.

BS 8233: 2014 Calculation Internal Levels in an Bedroom Windows Closed		Ref	Octave Band Centre Frequency (Hz)							Sum
			63	125	250	500	1K	2K	4K	
Free Field Level	$L_{eq,ff}$	**A**	66	64	69	69	63	60	59	**70 dB(A)**
Ventilation, $D_{n,e}$ MVHR (Side Vent) 1.8m Attenuator	$B = \frac{A_0}{s}.10^{\frac{-D_{n,e}}{10}}$	--	28	31	34	43	49	46	41	R_w 45 dB
		B	0.00073	0.00036	0.00018	0.00002	0.00001	0.00001	0.00004	
Windows, R_{wi} 8 – 20 – 6.4 (No Trickle Vents)	$C = \frac{S_{wi}}{s_f}.10^{\frac{-R_{wi}}{10}}$	1.2 m²	26	27	26	36	44	45	49	R_w 40 dB
		C	0.00012	0.00009	0.00012	0.00001	0.00000	0.00000	0.00000	
Façade, R_{ewi} Brick + Block 2 x 15mm SB	$D = \frac{S_e}{s_f}.10^{\frac{-R_{ew}}{10}}c$	8.8 m2	51	57	58	62	70	70	72	R_w 67 dB
		D	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	
Exposed Roof, R_{rr} Tiled 2 x 15mm SB	$E = \frac{S_{rr}}{s_f}.10^{\frac{-R_{rr}}{10}}$	12.0 m²	99	99	99	99	99	99	99	R_w 99 dB
		E	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	
$F = 10.\log_{10}(B + C + D + E)$		F	-30.7	-32.6	-36.4	-45.7	-51.4	-49.3	-44.4	--
A (Furnished)	$G = 10\log_{10}\left(\frac{S}{A}\right)$	--	11	11	14	16	16	15	15	--
		G	3.0	3.0	1.9	1.3	1.3	1.6	1.6	
Internal Level, $L_{eq,2}$	$L_{eq,2} = A+F+G+3$	--	41	37	39	29	16	16	19	**32 dB(A)**

D.2 Night Time (23:00 to 07:00) Habitable Room (Windows Closed)

D.2.1 The following is a summary of the main elements of the construction required within the proposed residential flats.

Ref	Element of Facade	Octave Band Centre Frequency (Hz)								Sum A	R_w
		63	125	250	500	1K	2K	4K	8K		
D2.B	Ventilation (MVHR)	28	31	34	43	49	46	41	(35)	--	45
D2.C	Window Closed - Glazing	26	27	26	36	44	45	49	(50)	--	40
D2.D	Façade Construction	51	57	58	62	70	70	72	(72)	--	57
D2.E	Ceiling of Room (Internal)	--	--	--	--	--	--	--	--	--	--
Sound Power Levels (dB) – Reference 1 x 10^{-12} watts – Uncertainty of +- 2.5 dB (95% confidence, k=2)											

D.2.2 The following calculations provides an estimate of the internal noise levels within the windows closed and the windows open to provide ventilation in line with the requirements of Approved Document F.

BS 8233: 2014 Calculation Internal Levels in an Bedroom Windows Closed		Ref	Octave Band Centre Frequency (Hz)							Sum
			63	125	250	500	1K	2K	4K	
Free Field Level	$L_{eq,\,ff}$	**A**	64	62	67	67	61	58	57	**68 dB(A)**
Ventilation, $D_{n,e}$ MVHR (Side Vent) 1.8m Attenuator	$B = \frac{A_0}{s}.10^{\frac{-D_{n,e}}{10}}$	--	28	31	34	43	49	46	41	R_w 44 dB
		B	0.00073	0.00036	0.00018	0.00002	0.00001	0.00001	0.00004	
Windows, R_{wi} 8 – 20 – 6.4 (No Trickle Vents)	$C = \frac{S_{wi}}{S_f}.10^{\frac{-R_{wi}}{10}}$	1.2 m²	26	27	26	36	44	45	49	R_w 42 dB
		C	0.00012	0.00009	0.00012	0.00001	0.00000	0.00000	0.00000	
Façade, R_{ewi} Brick + Block 2 x 15mm SB	$D = \frac{S_e}{S_f}.10^{\frac{-R_{ew}}{10}}c$	8.8 m2	51	57	58	62	70	70	72	R_w 68 dB
		D	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	
Exposed Roof, R_{rr} Tiled 2 x 15mm SB	$E = \frac{S_{rr}}{S_f}.10^{\frac{-R_{rr}}{10}}$	12.0 m²	99	99	99	99	99	99	99	R_w 72 dB
		E	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	
$F = 10.\log_{10}(B + C + D + E)$		F	-30.7	-32.6	-36.4	-45.7	-51.4	-49.3	-44.4	--
A (Furnished)	$G = 10\log_{10}\left(\frac{S}{A}\right)$	--	11	11	14	16	16	15	15	--
		G	3.0	3.0	1.9	1.3	1.3	1.6	1.6	
Internal Level, $L_{eq,\,2}$	$L_{eq,2} = A+F+G+3$	--	39	35	37	27	14	14	17	**30 dB(A)**

D.3 Day Time (07:00 to 23:00) Habitable Room (Windows Open)

D.3.1 The following is a summary of the main elements of the construction required within the proposed residential flats.

Ref	Element of Facade	Octave Band Centre Frequency (Hz)								Sum A	R_w
		63	125	250	500	1K	2K	4K	8K		
D3.B	Ventilation (MVHR)	28	31	34	43	49	46	41	(35)	--	45
D3.C	Window Open - Glazing	20	14	14	16	14	17	19	(15)	--	16
D3.D	Façade Construction	51	57	58	62	70	70	72	(72)	--	57
D3.E	Ceiling of Room (Internal)	--	--	--	--	--	--	--	--	--	--
Sound Power Levels (dB) – Reference 1 x 10^{-12} watts – Uncertainty of +- 2.5 dB (95% confidence, k=2)											

D.3.2 The following calculations provides an estimate of the internal noise levels within the windows closed and the windows open to provide ventilation in line with the requirements of Approved Document F.

BS 8233: 2014 Calculation Internal Levels in an Bedroom Windows Open		Ref	Octave Band Centre Frequency (Hz)							Sum
			63	125	250	500	1K	2K	4K	
Free Field Level	$L_{eq,\,ff}$	A	66	64	69	69	63	60	59	70 dB(A)
Ventilation, $D_{n,e}$ MVHR (Side Vent) 1.8m Attenuator	$B = \frac{A_0}{s}.10^{\frac{-D_{n,e}}{10}}$	--	28	31	34	43	49	46	41	R_w 45 dB
		B	0.00072	0.00036	0.00018	0.00002	0.00001	0.00001	0.00004	
Windows, R_{wi} 8 – 20 – 6.4 (No Trickle Vents)	$C = \frac{S_{wi}}{s_f}.10^{\frac{-R_{wi}}{10}}$	1.2 m²	20	14	14	16	14	17	19	R_w 42 dB
		C	0.00055	0.00217	0.00217	0.00137	0.00217	0.00109	0.00069	
Façade, R_{ewi} Brick + Block 2 x 15mm SB	$D = \frac{S_e}{s_f}.10^{\frac{-R_{ew}}{10}}c$	8.8 m2	51	57	58	62	70	70	72	R_w 67 dB
		D	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	
Exposed Roof, R_{rr} Tiled 2 x 15mm SB	$E = \frac{S_{rr}}{s_f}.10^{\frac{-R_{rr}}{10}}$	12.0 m²	99	99	99	99	99	99	99	R_w 99 dB
		E	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	
$F = 10.\log_{10}(B + C + D + E)$		F	-29.0	-26.0	-26.3	-28.6	-26.6	-29.6	-31.4	--
A (Furnished)	$G = 10\log_{10}\left(\frac{S}{A}\right)$	--	11	11	14	16	16	15	15	--
		G	3.0	3.0	2.0	1.4	1.4	1.7	1.7	
Internal Level, $L_{eq,\,2}$	$L_{eq,2} = A+F+G+3$	--	43	44	48	45	41	35	32	46 dB(A)

D.4 Night Time (23:00 to 07:00) Habitable Room (Windows Open)

D.4.1 The following is a summary of the main elements of the construction required within the proposed residential flats.

Ref	Element of Facade	Octave Band Centre Frequency (Hz)								Sum A	R_w
		63	125	250	500	1K	2K	4K	8K		
D4.B	Ventilation (MVHR)	28	31	34	43	49	46	41	(35)	--	45
D4.C	Window Open - Glazing	20	14	14	16	14	17	19	(15)	--	16
D4.D	Façade Construction	51	57	58	62	70	70	72	(72)	--	57
D4.E	Ceiling of Room (Internal)	--	--	--	--	--	--	--	--	--	--
Sound Power Levels (dB) – Reference 1 x 10^{-12} watts – Uncertainty of +- 2.5 dB (95% confidence, k=2)											

D.4.2 The following calculations provides an estimate of the internal noise levels within the windows closed and the windows open to provide ventilation in line with the requirements of Approved Document F.

BS 8233: 2014 Calculation Internal Levels in an Bedroom Windows Open		Ref	Octave Band Centre Frequency (Hz)							Sum
			63	125	250	500	1K	2K	4K	
Free Field Level	$L_{eq,\,ff}$	A	64	62	67	67	61	58	57	68 dB(A)
Ventilation, $D_{n,e}$ MVHR (Side Vent) 1.8m Attenuator	$B = \frac{A_0}{s}.10^{\frac{-D_{n,e}}{10}}$	--	28	31	34	43	49	46	41	R_w 44 dB
		B	0.00072	0.00036	0.00018	0.00002	0.00001	0.00001	0.00004	
Windows, R_{wi} 8 – 20 – 6.4 (No Trickle Vents)	$C = \frac{S_{wi}}{s_f}.10^{\frac{-R_{wi}}{10}}$	1.2 m²	20	14	14	16	14	17	19	R_w 42 dB
		C	0.00055	0.00217	0.00217	0.00137	0.00217	0.00109	0.00069	
Façade, R_{ewi} Brick + Block 2 x 15mm SB	$D = \frac{S_e}{s_f}.10^{\frac{-R_{ew}}{10}}c$	8.8 m2	51	57	58	62	70	70	72	R_w 68 dB
		D	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	
Exposed Roof, R_{rr} Tiled 2 x 15mm SB	$E = \frac{S_{rr}}{s_f}.10^{\frac{-R_{rr}}{10}}$	12.0 m²	99	99	99	99	99	99	99	R_w 72 dB
		E	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	
$F = 10.\log_{10}(B + C + D + E)$		F	-29.0	-26.0	-26.3	-28.6	-26.6	-29.6	-31.4	--
A (Furnished)	$G = 10\log_{10}\left(\frac{S}{A}\right)$	--	11	11	14	16	16	15	15	--
		G	3.0	3.0	2.0	1.4	1.4	1.7	1.7	
Internal Level, $L_{eq,\,2}$	$L_{eq,2} = A+F+G+3$	--	41	42	46	43	39	33	30	44 dB(A)

End of Report

E Appendix E – Concerns from Licensed Premises…

E.1 The Blues Kitchen – Objection to Proposed Development

E.1.1 The objection outlines some of the requirements that a residential development will need to consider within the London Borough of Camden all of which have been covered within the original noise impact assessment. At paragraph 15, they correctly identify the significant mitigation measures that have already been proposed to deal with all sources of noise impacting the proposed development and outline their concerns at paragraph 18.

a) *Acoustic glazing with a minimum performance or Rw 40 dB e.g. 6.8mm – 12mm argon filled airgap – 6.0mm toughened. Manufacturer to provide verified test certificate. Total thickness of 25mm.*
b) *No trickle type vents within the façade of the building.*
c) *MVHR whole house ventilation system with additional cooling or design to ensure windows do not need to be opened to control over-heating. The system will need to provide an over performance of Rw 45 dB or more which could be achieved with standard 1,800mm long attenuators.*
d) *Additional cooling unit to the MVHR ventilation system to ensure that windows never need to be opened to control over-heating.*

"Paragraph 18
In our view, before any decision is made, the Applicant should submit a revised Assessment that deals with The Blues Kitchen (and any other relevant live music/hospitality venues) and to determine whether further noise mitigation measures are required. "

E.2 Camden Head Public House – Objection to Proposed Development

E.2.1 The objection again outlines some of the requirements that a residential development will need to consider within the London Borough of Camden all of which are covered within the original noise impact assessment. There concerns are summarised within the section entitled *"Recommendations".*

"Our client fully endorses the recommendation made by another nearby operator (ie. The Blues Kitchen) that there should be a specific 'agent of change' obligation included within a Section 106 agreement. This should cover the following items:-

i. *The owner must provide information to any occupier or potential occupier of the development that they are situated near a music and night time entertainment venue;*
ii. *An appropriately detailed sound-proofing scheme within the development, as assessed and approved by the Council, must be retained for the lifetime of the development; and*
iii. *The developer and/or owner will be responsible for future costs of sound-proofing if required.*
iv. *A Construction Management Plan to be submitted and approved by the Council; and implemented accordingly, consistent with Policy A4."*

E.3 Extensive Mitigation Measures

E.3.1 The main source of noise impacting the proposed residential development is very high levels of traffic noise from Camden High Street. The extensive mitigation measures include high specification acoustic glazing, full internal MVHR ventilation and additional cooling units. This ensures that even the hottest period residents will not need to open their windows to control over-heating.

E.3.2 These mitigation measures are designed to ensure that when the external noise level is around 70 dB(A) at the residential façade the internal noise levels are suitable to allow residents to sleep at all times of the day or night with a resultant internal noise level of 30 dB(A). There are no other mitigation measures that could be included to reduce the noise levels further.

E.4 Noise Emissions from Licensed Premises

E.4.1 The concerns of both objectors are noted. However, neither objector mentions that there are already existing residential dwellings in close proximity to both venues. Neither venue can generate unlimited amount of noise as they are bound by the following statutory restrictions imposed by the existing residential dwellings.

a) Must not cause a Statutory Nuisance under the Environmental Protection Act 1990 (As Amended in 1993).
b) Must not cause a Public Nuisance as required by the Licensing Act 2003 section 4 (2) (c).
c) Must meet the requirement of Policy A4 entitled *"Noise and vibration"* of the Camden Local Plan.
d) Must ensure *"Noise levels shall be adjusted to ensure local residents are not disturbed by noise breakout"* as detailed in the Camden Statement of Licensing Policy 2022 – 2027.

E.4.2 The following shows the relative positions of the proposed development, and the two licensed premises that have raised objections to the development (purple) and the existing residential dwellings (red).

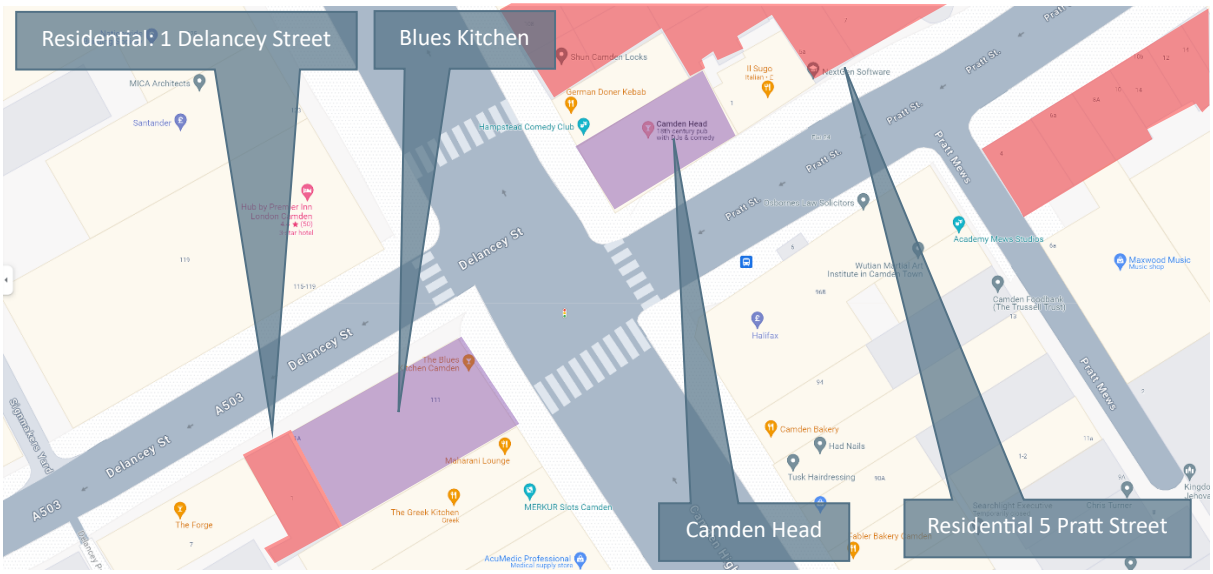


Figure 11 – Plan View of existing licensed premises and existing residential dwellings.

E.4.3 The following shows the street view and exact location of the existing residential dwelling in respect of both venues.

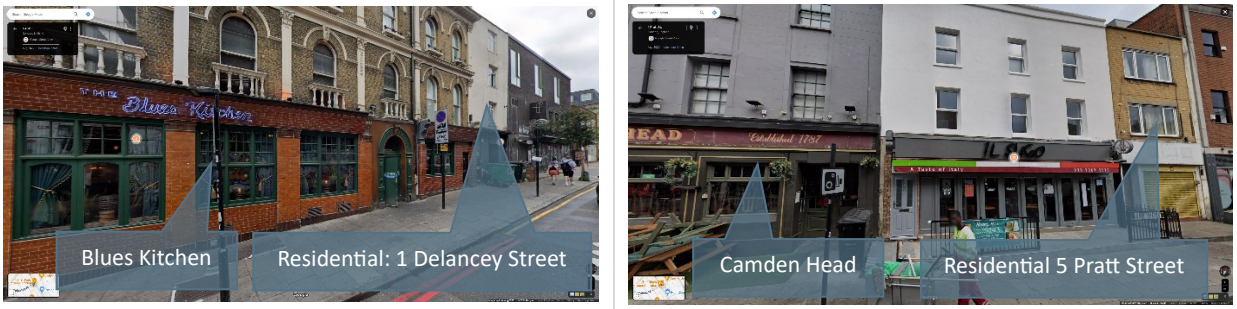


Figure 12 – Street view of existing licensed premises and existing residential dwellings.

E.4.4 The following table shows the current premises license for each venue and the currently permitted opening times. The current restrictions on opening times will have been driven by the proximity of the existing residential dwellings. These are typical opening times for this type of location where there is a potential for conflict between a licensed premises and existing residential dwellings.

Venue	Premises License	Days of the Week						
		Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Blues Kitchen	PREM-LIC/1807 28/08/05	12:00-23:59	12:00-23:59	12:00-01:00	12:00-01:00	12:00-02:30	11:00-03:00	11:00-01:00
Camden Head	REM-LIC/2515 24/08/05	12:00-01:00	12:00-01:00	12:00-01:00	12:00-01:00	12:00-03:00	12:00-03:00	12:00-01:00

Figure 13 – Existing opening times of nearby licensed premises.

E.4.5 The existing ambient noise levels in Camden during the late evenings is unlikely to drop below 65 dB $L_{Aeq,\ 5\ minutes}$. To comply with Table D of Appendix 3 of the Camden Local Plan entitled "*Noise levels applicable to proposed entertainment premises*" the noise levels would be 55 dB $L_{Aeq,\ 5\ minutes}$.

E.4.6 If we now create a 3D noise map of the existing situation and place a receptor in front of the existing residential dwellings we can increase the noise emitted from each venue until the threshold limit of 55 dB $L_{Aeq,\ 5\ minutes}$ is met. The resultant noise level at the façade of the proposed residential development can then be calculated. This will show the difference between the existing and proposed residential dwellings.

E.4.7 The following noise map shows that the operation of both venues will result in noise levels at the proposed development that is around 5 dB(A) above the noise emissions experienced by the existing residential dwellings. However, at an average level of 60 dB LAeq, 5 minutes the level is around 10 dB(A) below the highest level of traffic noise that the mitigation measures have been designed to control.

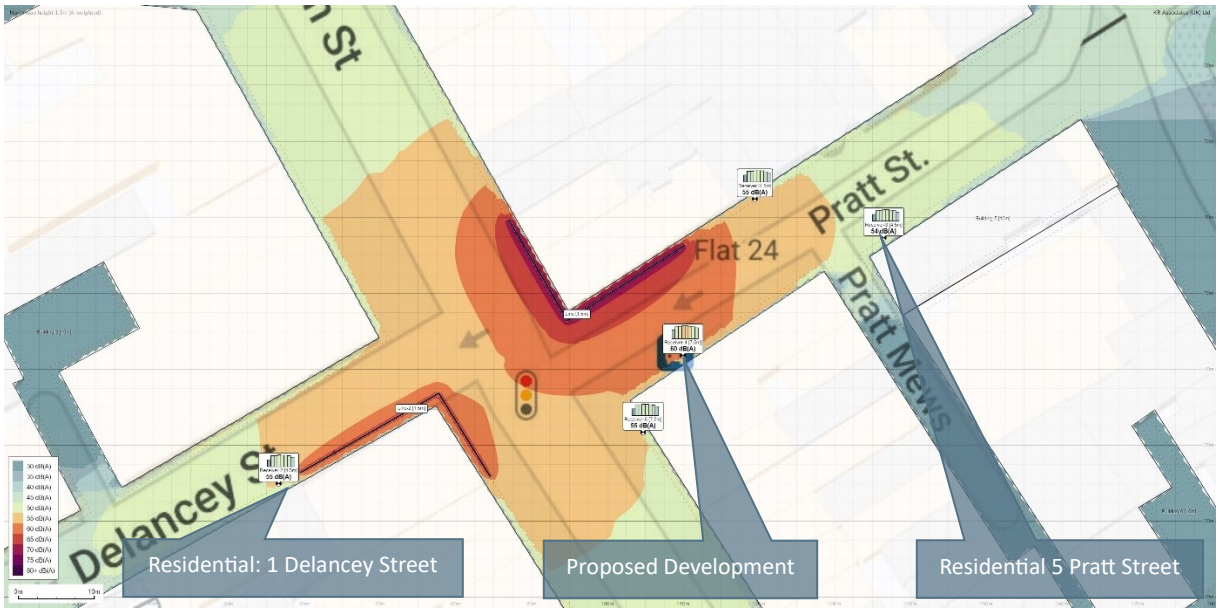


Figure 14 – 3D noise map of the existing noise emissions.

E.5 Noise Rating Curve 25

E.5.1 Appendix 3 of the Camden Local plan also includes a definitive criterion for entertainment noise which requires that between 23:00 and 07:00 hours the average 15-minute internal noise level does not exceed NR 25. The above 3D noise map was created using a music noise source with a heavy bass content and therefore we can run a calculation of the likely internal noise levels from the operation of both licensed premises.

E.6 Night Time (23:00 to 07:00) Habitable Room (Windows Closed)

E.6.1 The following is a summary of the main elements of the construction required within the proposed residential flats. The flats will be fitted with a full MVHR system with additional integrated cooling unit so that the future residents will never have to open their windows to control over-heating.

Ref	Element of Facade	Octave Band Centre Frequency (Hz)								Sum A	R_w
		63	125	250	500	1K	2K	4K	8K		
D2.B	Ventilation (MVHR)	28	31	34	43	49	46	41	(35)	--	45
D2.C	Window Closed - Glazing	26	27	26	36	44	45	49	(50)	--	40
D2.D	Façade Construction	51	57	58	62	70	70	72	(72)	--	57
D2.E	Ceiling of Room (Internal)	--	--	--	--	--	--	--	--	--	--

Sound Power Levels (dB) – Reference 1 x 10^{-12} watts – Uncertainty of +- 2.5 dB (95% confidence, k=2)

Table 24 – Proposed performance of the individual elements of the proposed residential façade.

E.6.2 The following calculations provides an estimate of the internal noise levels with the windows closed to provide ventilation in line with the requirements of Approved Document F.

BS 8233: 2014 Calculation Internal Levels in an Bedroom Windows Closed		Ref	Octave Band Centre Frequency (Hz)							Sum
			63	125	250	500	1K	2K	4K	
Free Field Level	$L_{eq,ff}$	A	77	66	59	56	53	51	48	**60 dB(A)**
Ventilation, $D_{n,e}$ MVHR (Side Vent) 1.8m Attenuator	$B = \frac{A_0}{s}.10^{\frac{-D_{n,e}}{10}}$	--	28	31	34	43	49	46	41	R_w 44 dB
		B	0.00073	0.00036	0.00018	0.00002	0.00001	0.00001	0.00004	
Windows, R_{wi} 8 – 20 – 6.4 (No Trickle Vents)	$C = \frac{S_{wi}}{s_f}.10^{\frac{-R_{wi}}{10}}$	1.2 m²	26	27	26	36	44	45	49	R_w 42 dB
		C	0.00012	0.00009	0.00012	0.00001	0.00000	0.00000	0.00000	
Façade, R_{ewi} Brick + Block 2 x 15mm SB	$D = \frac{S_e}{s_f}.10^{\frac{-R_{ew}}{10}}c$	8.8 m2	51	57	58	62	70	70	72	R_w 68 dB
		D	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	
Exposed Roof, R_{rr} Tiled 2 x 15mm SB	$E = \frac{S_{rr}}{s_f}.10^{\frac{-R_{rr}}{10}}$	12.0 m²	99	99	99	99	99	99	99	R_w 72 dB
		E	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	
$F = 10.\log_{10}(B + C + D + E)$		F	-30.7	-32.6	-36.4	-45.7	-51.4	-49.3	-44.4	--
A (Furnished)	$G = 10\log_{10}\left(\frac{S}{A}\right)$	--	11	11	14	16	16	15	15	--
		G	3.0	3.0	1.9	1.3	1.3	1.6	1.6	
Internal Level, $L_{eq,2}$	$L_{eq,2} = A+F+G+3$	--	52	39	28	15	6	6	8	**29 dB(A)**
Table B.1 of BS 8233: 2014 – NR 25			55.2	43.7	35.2	29.2	25.0	21.9	17.7	35 dB(A)
Compliance with Camden Criterion			-3.0	-4.3	-7.7	-14.6	-19.0	-15.5	-11.2	Yes

Table 25 – Calculation of internal noise levels form the music noise from nearby licensed premises.

E.6.3 The above table indicates that the existing permitted music noise from both venues will meet the absolute criterion within the proposed residential dwellings as a detailed in Appendix 3 of the Camden Local Plan i.e. internal noise levels between 23:00 and 07:00 of below NR25 dB. For reference the proposed noise emissions from the licensed venues would result in an overall sound pressure level 1m from the window of the Camden Head Public House of 70 dB(A). It is very unlikely that the noise emissions from the music noise at the venue will ever exceed these values with the existing constraints placed on the site by the existing residential dwellings.

Ref	Location	Octave Band Centre Frequency (Hz)								Sum(A)
		63	125	250	500	1K	2K	4K	8K	
1	1m from Camden Head PH	90	75	69	66	62	60	58	57	70
Sound Power Levels (dB) – Reference 1 x 10^{-12} watts – Uncertainty of +- 2.5 dB (95% confidence, k=2)										

Table 26 – Assumed music noise levels 1m externally from the façade of the Camden Head Public House.

E.7 Conclusions

E.7.1 The extremely high traffic noise levels have driven the design of the façade of the proposed residential dwellings resulting in extensive mitigation measures including high specification acoustic glazing and a full MVHR ventilation system with additional cooling function. The current permitted music noise levels from the Camden Head Public House, Blues Kitchen and any other licensed premises will result in internal noise levels within the proposed residential flats that comply in full with Appendix 3 of the Camden Local Plan for entertainment venues. i.e. the internal 15-minute noise level will not exceed NR 25.


ASSOCIATES