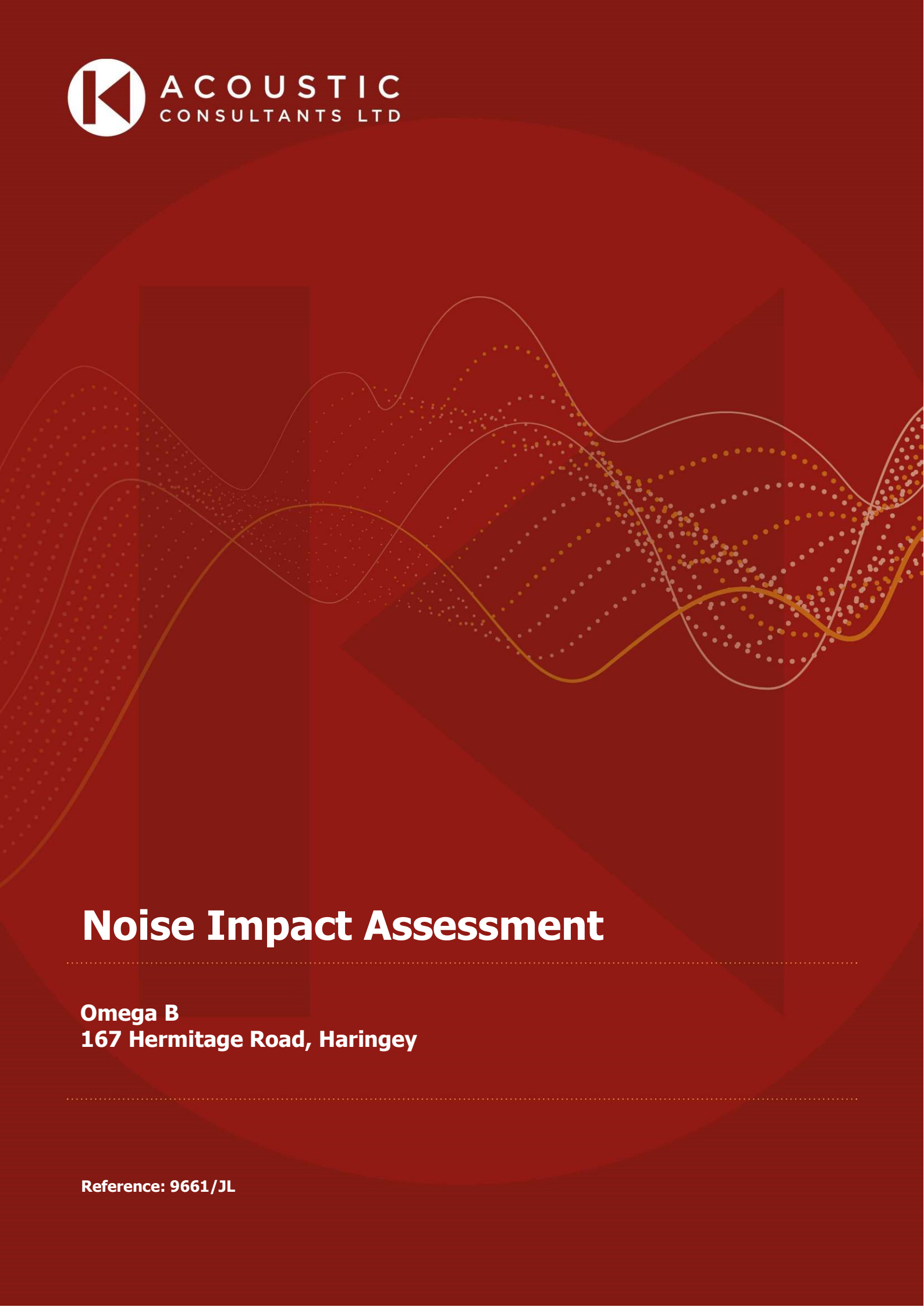




Noise Impact Assessment

Omega B
167 Hermitage Road, Haringey

Reference: 9661/JL

Client:

Majorlink Limited

Document Control

Version	Revision Description	Date	Author:	Reviewed by:
1.0	--	13/05/2022	Jonas Lopez	Blake Lucas
2.0	New Noise Survey	16/06/2022	Jonas Lopez	Blake Lucas

The report has been prepared in good faith, with all reasonable skill and care, based on information provided or available at the time of its preparation and within the scope of work agreement with the Client. We disclaim any responsibility to the Client and others in respect of any matters outside the scope of the above. The report is provided for the sole use of the named Client and is confidential to them and their professional advisors. No responsibility is accepted to other parties.

The report limits itself to addressing solely on the noise aspects as included in this report. We provide advice only in relation to noise and acoustics. It is recommended that appropriate expert advice is sought on all the ramifications (e.g. CDM, structural, condensation, fire, legal, etc.) associated with any proposals in this report or as advised and concerning the appointment. It should be noted that noise predictions are based on the current information as we understand it and on the performances noted in this report. Any modification to these parameters can alter the predicted level. All predictions are in any event subject to a degree of tolerance of normally plus or minus three decibels. If this tolerance is not acceptable, then it would be necessary to consider further measures.

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1. Introduction

Majorlink Limited appointed Acoustic Consultants Limited to provide a noise impact assessment for the proposed residential development at 167 Hermitage Road, Haringey. The development comprises of the demolition of the current buildings at the site and the erection of 2 new mixed-use buildings.

This report provides the results of a noise survey conducting on the site and an assessment of external sources of noise on the sensitive elements of the development.

The noise impact assessment has been undertaken in accordance with the guidance in the National Planning Policy Framework (NPPF), Noise Policy Statement for England (NPSE), National Planning Practice Guidance (NPPG), British Standard 8233:2014 (BS8233) and the local authority criteria.

The author of this report is a Full Member of the Institute of Acoustics (MIOA) with over 4 years of experience within the field of noise and acoustics.

2. The Site

The proposed development will comprise 2 new mixed-use buildings including commercial spaces in the ground floor and residential properties in the floors above. The site is located on the north side of Hermitage Road and is surrounded by residential properties to the east, south and west, and by retail units to the north of the site.

The main sources of noise affecting the site are road traffic along Hermitage Road and plant and road traffic noise related to the retail units to the north. A 3D google image of site location and proposed site plans are shown in the figures below.

Figure 1: Google Site Location



3. Assessment Criteria

3.1. National Planning Policy Framework

The National Planning Policy Framework (NPPF) was published in March 2012 and revised in July 2021. Section 15 entitled 'Conserving and enhancing the natural environment addresses noise as a requirement of planning. Paragraph 174 states:

"174. Planning policies and decisions should contribute to and enhance the natural and local environment by:

- e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and f) remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate."*

Paragraph 185 states:

"185. Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

- a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life⁶⁰*
- b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason; and*
- c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.*

The NPPF does not prescribe any assessment methodology or criteria to assess the adverse effect of noise.

60 See Explanatory Note to the Noise Policy Statement for England (Department for Environment, Food & Rural Affairs, 2010).

3.2. Noise Policy Statement for England

The NPPF refers to the Noise Policy Statement for England (NPSE). This was published in March 2010 and aims to provide clarity regarding current policies and practices to enable noise management decisions to be made within the wider context, at the most appropriate level, in a cost-effective manner and in a timely fashion and applies to all forms of noise including environmental noise, neighbour noise and neighbourhood noise.

The NPSE sets out the long-term vision of Government noise policy. This long-term vision is supported by three noise policy aims as follows:

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

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

The NPSE introduces the concept of "Significant adverse" and "Adverse" impacts of noise which relate to the noise policy aims. These are applied as follows:

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.

The Noise Policy Statement for England (NPSE) states that noise levels above the Lowest Observed Adverse Effect Level are acceptable in planning where reduced to a minimum.

With regard to where there is potential for noise impact it states the following in relation to the second noise policy aim:

"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."

The NPSE does not provide any assessment criteria for the noted effect levels and each case must be considered on its merits. The NPSE does, however, emphasise that in dealing with noise Local Planning Authorities are required to take a balanced approach in considering the benefits of development as against any adverse effects which arise. Paragraph 2.18 of the NPSE is particularly relevant in this respect and states:

"There is a need to integrate consideration of the economic and social benefits of the activity or policy under examination with proper consideration of the adverse environmental effects, including the impact of noise on health and quality of life. This should avoid noise being treated in isolation in any particular situation, i.e. not focusing solely on the noise impact without taking into account other related factors."

The planning need is outside the scope of noise and acoustics and will need to be addressed by others.

3.3. **National Planning Practice Guidance, Noise**

The National Planning Practice Guidance (NPPG) on noise referred to here is based on the current version (January 2015) as provided on the Planning Guidance Website. It states that *"Noise needs to be considered when new developments may create additional noise and when new developments would be sensitive to the prevailing acoustic environment."*

It provides generic guidance on how to determine the noise impact and what factors could be a concern. It includes the option types to mitigate any adverse effects of noise stating that there are four broad types of mitigation. These are engineering, layout, using planning conditions or obligations and noise insulation.

Paragraph 5 of the NPPG provides a table identifying the effect level and examples of effect relating to the impact effect levels provided in the NPSE. The table is duplicated below:

Table 1: NPPG Noise – Perception of Effect Levels

Response	Examples of outcomes	Increasing effect level	Action
No Observed Effect Level			
Not present	No Effect	No Observed Effect	No specific measures required
No Observed Adverse Effect Level			
Present and 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 Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Present and 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.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Present and 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 in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Present and very disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

The table does not provide any objective assessment which equates to the noted effect levels however the NPPG identifies that where noise is audible it is not necessarily intrusive. The effect and impact on people is based primarily on the level of noise.

3.4. British Standard 8233:2014

British Standard 8233:2014 entitled "Guidance on sound insulation and noise reduction for buildings" provides internal ambient noise levels for dwellings from noise sources 'without a specific character'. The British Standard guideline states that noise levels should not exceed those as noted in Table 2 of the British Standard. These criteria are based on the guidance provided within WHO 1999 and are summarised below:

Table 2: British Standard 8233:2014 Internal Noise Criteria

Activity	Location	Daytime (07:00 to 23:00)	Night-time (23:00 to 07:00)
Resting	Living Room	35 dB $L_{Aeq,16\text{ hour}}$	-
Dining	Dining Room/area	40 dB $L_{Aeq,16\text{ hour}}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16\text{ hour}}$	30 dB $L_{Aeq,8\text{ hour}}$

Section 7.7.2 Note 4 of the British Standard states *"Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or $L_{Amax,F}$ depending on the character and number of events per night. Sporadic noise events could require separate values"*.

British Standard BS8233 provides no definitive criteria for maximum noise levels from individual events ($L_{Amax,F}$). Section 3.4 of the "Guidelines for Community Noise" published by the World Health Organisation in 1999 (WHO 1999) states *"For a good sleep, it is believed that indoor sound pressure levels should not exceed approximately 45 L_{Amax} more than 10-15 times per night (Vallet & Verbey 1991)"*.

As such, maximum noise levels would be considered acceptable if the maximum noise level from individual events do not exceed 45 dB $L_{Amax(F)}$ no more than 10 to 15 times during the night-time period.

Note 7 of BS8233:2014 states *"Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved."*

3.5. British Standard 4142:2014+A1:2019

British Standard 4142:2014+A1:2019 entitled 'Method for rating and assessing industrial and commercial sound' use outdoor sound levels to assess the likely effects of sound upon people who might be inside or outside a dwelling or other premises used for residential purposes. The principle is that of establishing the 'difference' between the 'rating level' and the 'background sound level'.

The 'rating level' is the 'specific sound level' of the source over a period of one hour during the day (07:00 to 23:00 hours) and over a period of 15 minutes during the night (23:00 to 07:00 hours).

Section 9 entitled 'Rating Level' states: "Certain acoustic features can increase the significance of impact over that expected from a basic comparison between the specific sound level and the background sound level. Where such features are present at the assessment location, add a character correction to the specific sound level to obtain the rating level."

An acoustic character correction should be added to the 'specific sound level' if it exhibits any tonality, impulsivity, other specific characteristics and/or intermittency at the assessment location. The value of the character correction varies, dependent on the prominence of the character of the sound source at the assessment location.

In Section 11 of the Standard, entitled 'Assessment of the Impacts', it states: "Obtain an initial estimate of the impact of the specific sound by subtracting the measured background sound level (see Clause 8) from the rating level (see Clause 9) and consider the following.

- *Typically, the greater this difference, the greater the magnitude of the impact.*
- *A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.*
- *A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.*
- *The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context."*

3.6. **Approved Document O**

The relevant noise requirements under overheating conditions in the soon to be adopted Approved Document O are as follows:

"Noise 3.2 In locations where external noise may be an issue (for example, where the local planning authority considered external noise to be an issue at the planning stage), the overheating mitigation strategy should take account of the likelihood that windows will be closed during sleeping hours (11pm to 7am).

3.3 Windows are likely to be closed during sleeping hours if noise within bedrooms exceeds the following limits.

- a. 40dB LAeq,T, averaged over 8 hours (between 11pm and 7am).*
- b. 55dB LAFmax, more than 10 times a night (between 11pm and 7am).*

3.4 Where in-situ noise measurements are used as evidence that these limits are not exceeded, measurements should be taken in accordance with the Association of Noise Consultants' Measurement of Sound Levels in Buildings with the overheating mitigation strategy in use. NOTE: Guidance on reducing the passage of external noise into buildings can be found in the National Model Design Code: Part 2 – Guidance Notes (MHCLG, 2021) and the Association of Noise Consultants' Acoustics, Ventilation and Overheating: Residential Design Guide (2020)."

4. Noise Survey

An acoustic engineer attended the site on 15th June 2022 to set up two sets of noise monitoring equipment and collected them on 16th June 2022.

4.1. Monitoring Equipment

Sound Pressure Levels were measured using three Class 1 sound level meters with half-inch condenser microphones, using the 'fast' setting. The equipment is checked regularly using a Quality System meeting the requirements of British Standard EN ISO/IEC 17025:2017 "General requirements for the competence of testing and calibration laboratories"; in accordance with British Standard EN 10012:2003 "Measurement management systems. Requirements for measurement processes and measuring equipment"; and traceable to the National Standards.

This equipment was checked and calibrated as noted below and the certificates are available for inspection.

Table 3: Equipment and Calibration Status

Equipment Description / Manufacturer / Type	Serial Number	Date of Calibration	Calibration Certification Number
SLM, NTI, XL2	A2A-19376-E0	19/07/2021	UK-21-064
Pre-Amp, NTI, MA220	8322	19/07/2021	UK-21-064
Microphone, NTI, MC230A	A20671	19/07/2021	UK-21-064
Larson Davies, CAL 200	18914	15/06/2021	44362
SLM, NTI, XL2	A2A-17200-E0	10/05/2022	UK-22-029
Pre-Amp, NTI, MA220	8848	10/05/2022	UK-22-029
Microphone, NTI, MC230A	A22973	10/05/2022	UK-22-029
Calibrator, CEL-284/2	3-02716829	28/10/2021	39311

4.2. Weather Conditions

Conditions during the survey were generally dry and clement, with an average temperature approximately 24 degrees Celsius and wind speeds between 4-6 mph.

4.3. Monitoring Procedure

In order to assess the existing ambient and background noise climate at the site, two sets of long-term monitoring equipment were set up from 15/06/2022 until 16/06/2022.

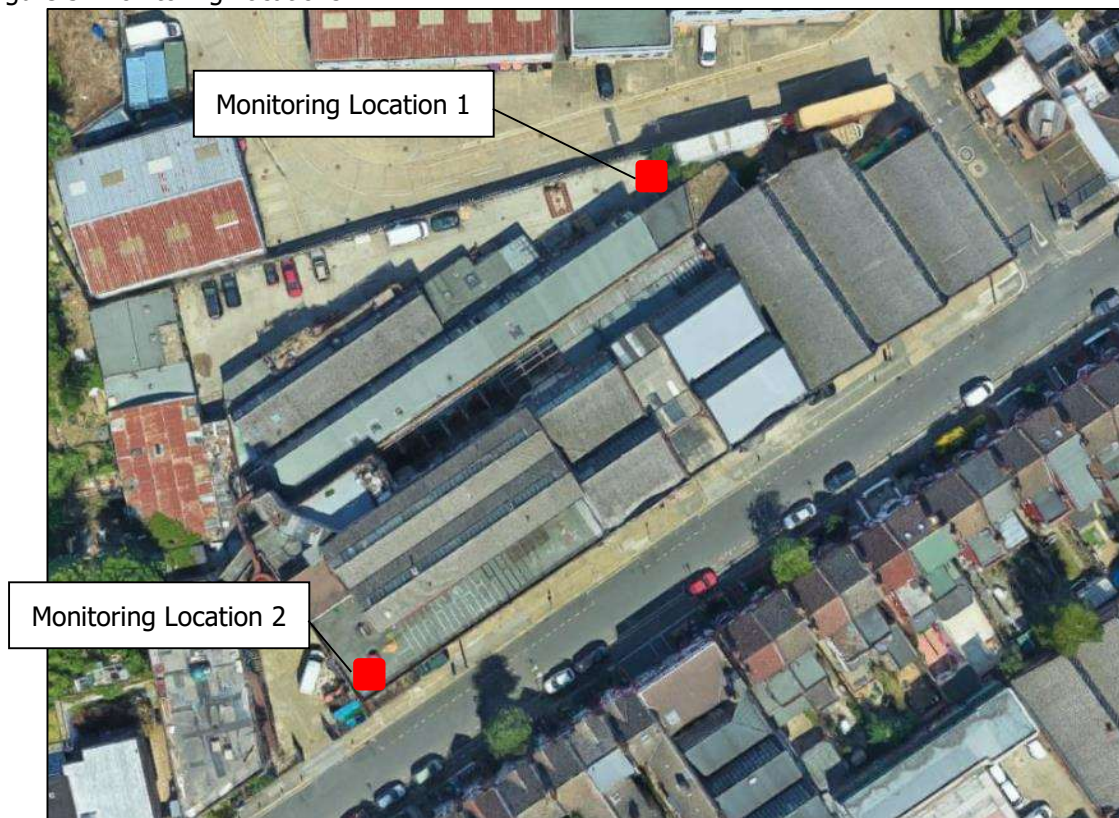
One set of equipment was installed at the rear side of the development representative of the noise from the industrial state to the north of site. The second set was installed on the roof of the building to the front of site on a tripod at a height of approximately 1.5 metres off the roof. This location captured the noise from the road traffic at Hermitage Road. Both proposed monitoring locations are shown in Figure 3.

The main noise sources around the site were road traffic noise from Hermitage Road and noise emitted by the industrial state to the north of site.

4.3.1. Monitoring Locations

Monitoring Locations are as follows:

Figure 3: Monitoring Locations

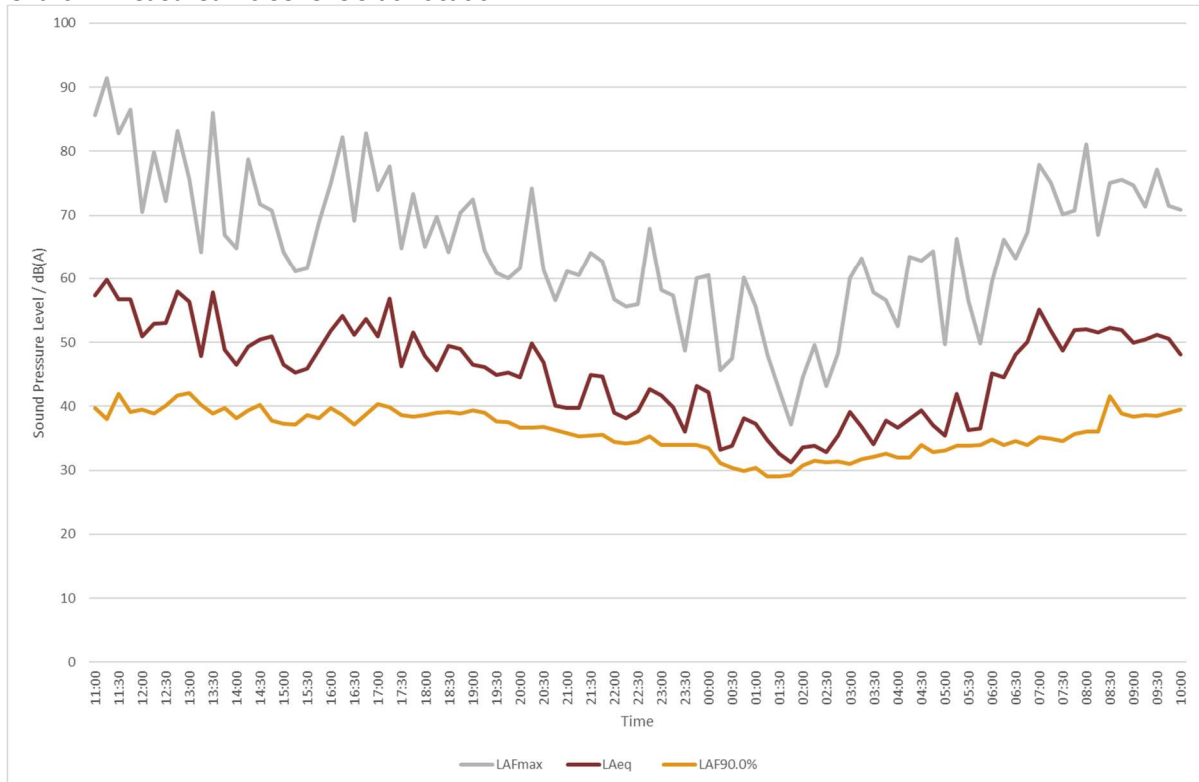


4.4. Measured Noise Levels

4.4.1. Location 1

The relevant data from the survey is the A-weighted L_{eq} , and L_{max} , spectral values and L_{A90} values which are displayed below in both tabulated and graph form below. The variation in noise levels is provided below:

Chart 1: Measured noise levels at Location 1



The tabulated octave band data from this location is given below.

Table 4: Logarithmically averaged noise data at Location 1

Period	Parameter	Sound Pressure Level per Octave Band / dB								dB(A)
		63	125	250	500	1000	2000	4000	8000	
Day	L_{eq16hr}	57	54	52	49	47	44	39	33	52
Night	L_{eq8hr}	49	47	43	38	34	31	26	20	41
	L_{Fmax}	73	67	64	60	57	58	55	48	64

The background sound levels are as follows:

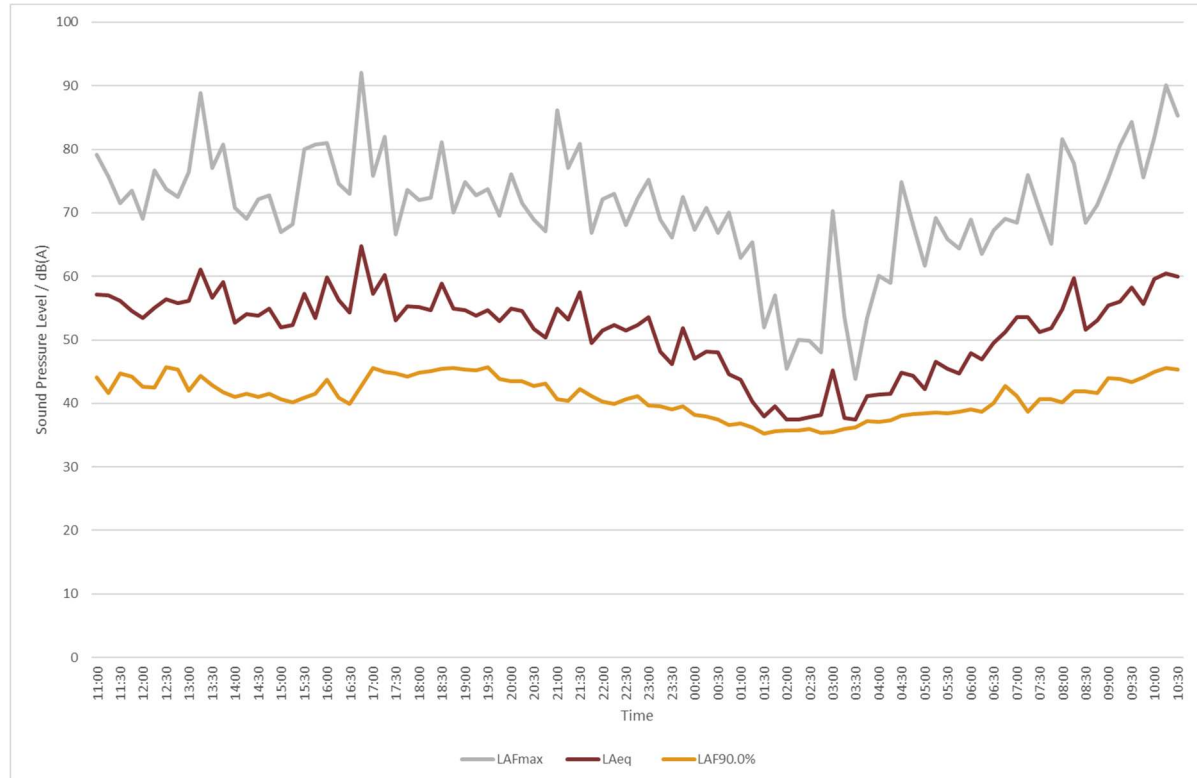
Table 5: Baseline Background Sound Levels at Location 1

Period	$L_{A90,15min}$	
	Range	Mode
Day (07:00 - 23:00)	34 - 42	39
Evening (19:00 - 23:00)	34 - 39	35
Night (23:00 - 07:00)	29 - 35	34

4.4.2. Location 2

The relevant data from the survey is the A-weighted L_{eq} , and L_{max} , spectral values and L_{A90} values which are displayed below in both tabulated and graph form below. The variation in noise levels is provided below:

Chart 2: Measured noise levels at Location 2



The tabulated octave band data from this location is given below.

Table 6: Logarithmically averaged noise data from at Location 2

Period	Parameter	Sound Pressure Level per Octave Band / dB								dB(A)
		63	125	250	500	1000	2000	4000	8000	
Day	L_{eq16hr}	58	57	56	55	51	48	43	36	57
Night	L_{eq8hr}	52	49	45	43	41	39	34	28	46
	L_{Fmax}	72	71	67	67	66	64	59	51	71

The background sound levels at the front are as follows:

Table 7: Baseline Background Sound Levels at Location 2

Period	$L_{A90,15min}$	
	Range	Mode
Day (07:00 - 23:00)	39 - 46	41
Evening (19:00 - 23:00)	40 - 46	41
Night (23:00 - 07:00)	35 - 43	36

5. Noise Modelling

To determine noise levels across the site, noise modelling has been undertaken using computer modelling package Cadna:A by DataKustik and the road traffic / plant noise / commercial data noted above.

The software predicts road traffic noise propagation using the method of 'The Calculation of Road Traffic Noise 1988', and a verification model has been created to ensure the measured and predicted levels are comparable. This model is available upon request.

The modelling parameters within Cadna:A are as follows:

- All buildings are considered reflective and third order reflections have been calculated.
- The heights of the proposed dwellings are based on the supplied elevations.
- The height of all other building has been determined from google street view and on-site observations.
- The ground surrounding the site has been modelled of hard and reflective.
- The site layout follows the provided plans.
- The noise map is predicted for a 1m by 1m grid at a height of 4.5 meters above the ground.
- Noise levels on the building façade are the highest levels determined at façade.
- Road traffic has been included in the model and verified to the measurement data.
- Tail lift delivery data within the industrial area has been included as this type of event is likely to happen during the daytime period but was not present during the survey.

A noise map of the predicted incident noise levels at the proposed residential development is provided below for the daytime and night-time periods.

Figure 4: Daytime dB LAeq(16hr) noise affecting development

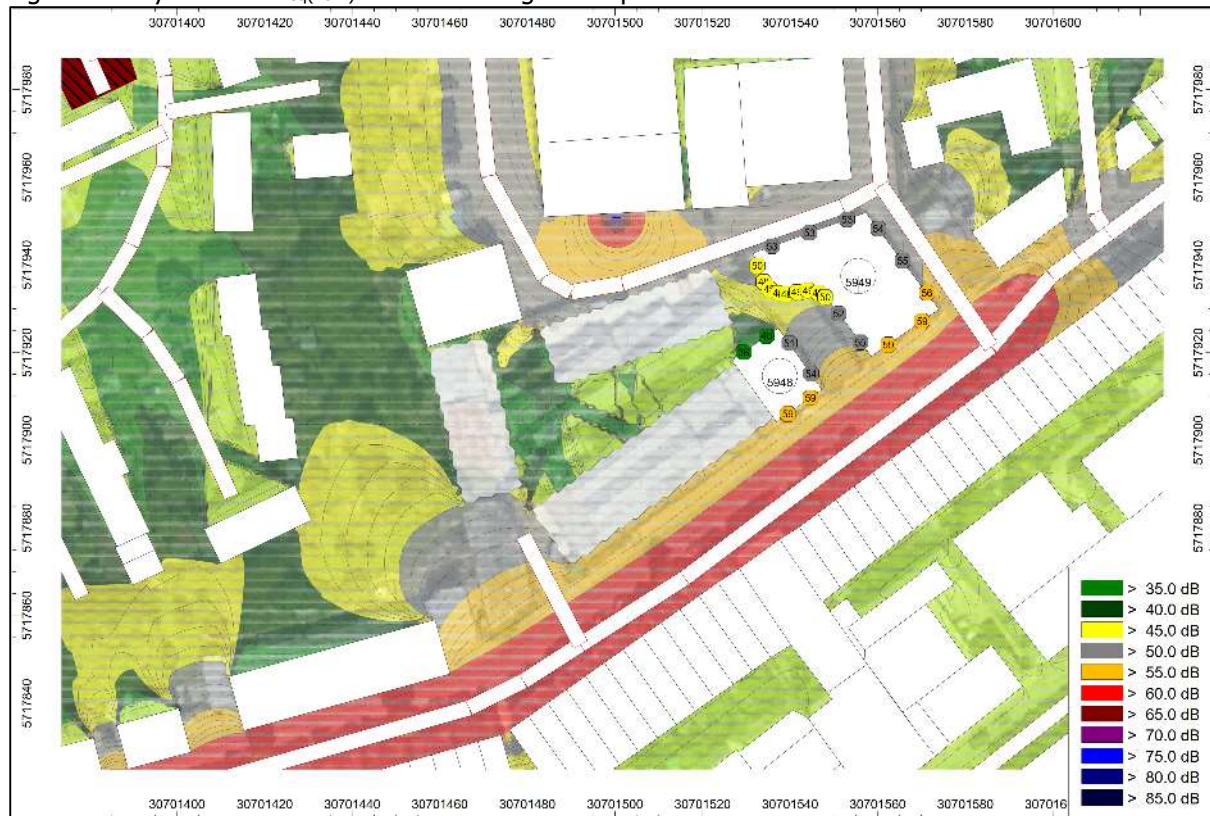
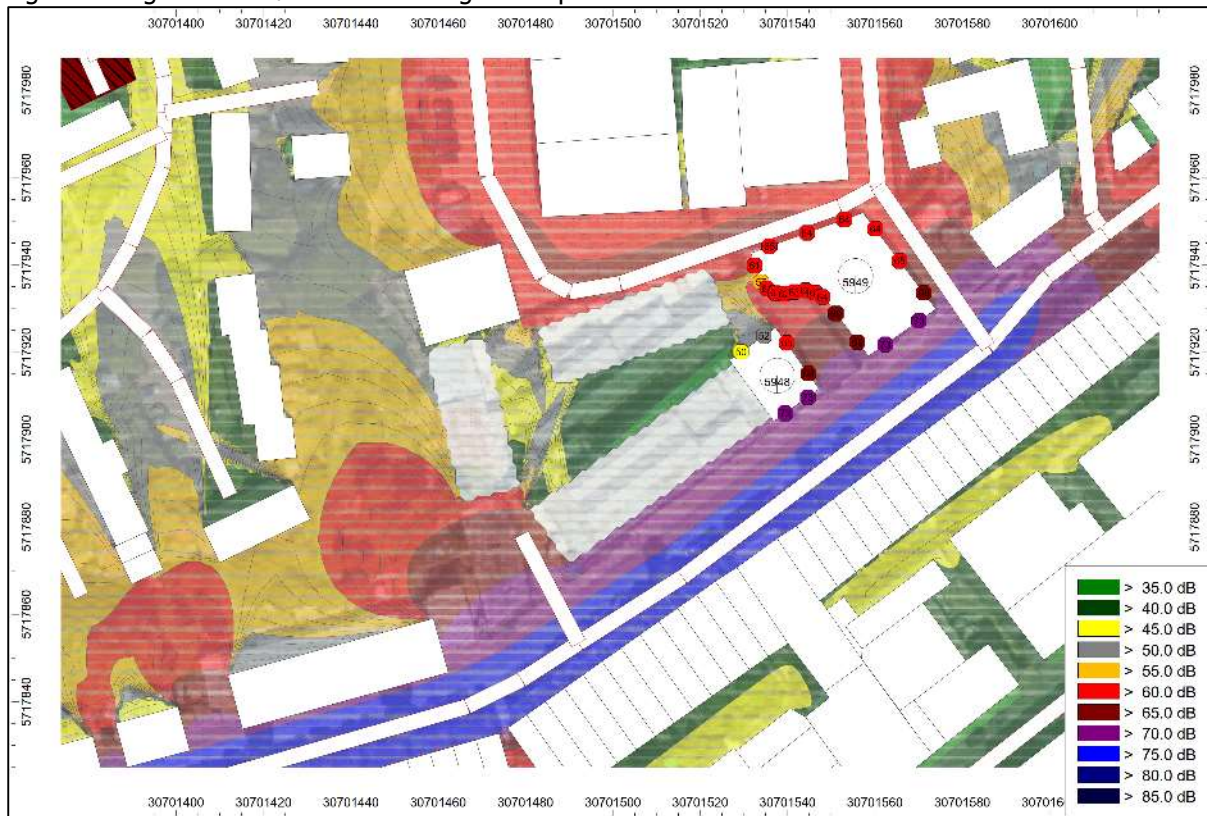


Figure 5: Night-time dB LAeq(8hr) noise affecting development



Figure 6: Night dB LAFmax noise affecting development



6. Noise Assessment for Dwellings

6.1. Calculation Method

Calculations for the internal ambient noise levels due to external noise have been undertaken using the calculation method provided in Annex G Section G.2 of British Standard 8233:2014.

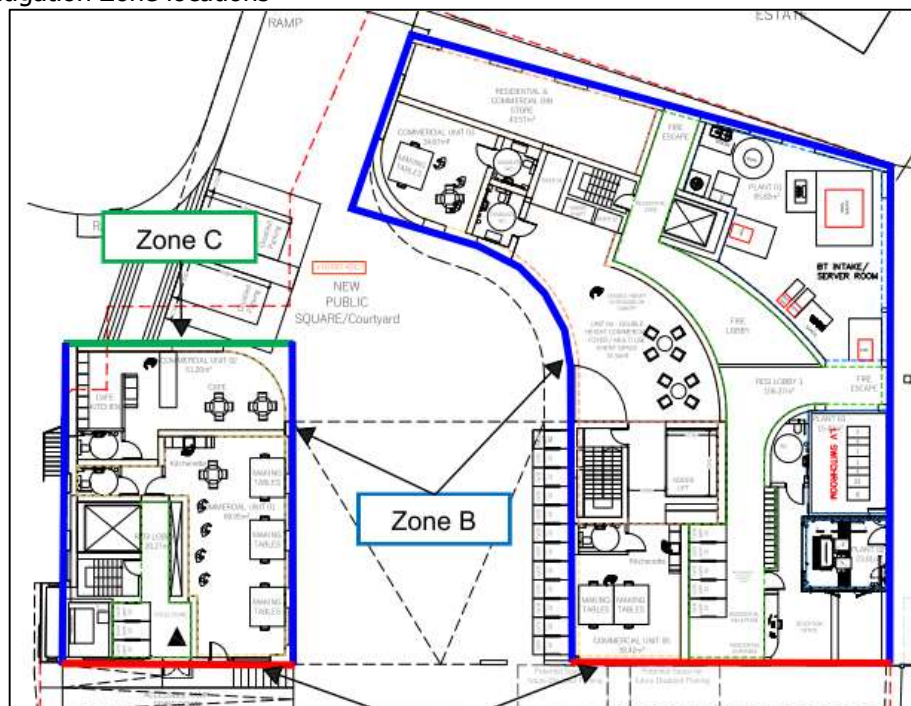
The calculations have been undertaken using the building façade construction specified below and the octave band free-field design equivalent noise levels and maximum noise levels taken from the measured noise spectra noted above. The calculations are based on the architectural drawings 121_A_01_XX-PP6 issued on 19/07/2021 by vPP Architects, 0092_FE_00X issued on 28/01/2022 by DHaus and the assumption of 1 vent per space.

We advise that building elements, having the sound insulation performances noted below, be incorporated into the design of the façades including the windows and ventilation elements of the building.

6.2. Mitigation Locations

We have rationalised mitigation measures down to three zones in order to keep the acoustic design of the scheme as concise as possible. The mitigation locations are marked up in Figure 7 below.

Figure 7: Mitigation Zone locations



6.3. Building Façade Constructions

The required attenuation of the façade and ventilation measures have been calculated in accordance with the method of Annex G.2 of British Standard 8233:2014 using the sound level spectra noted. Alternative constructions to those noted below could be used, however they would need to be assessed to ensure they control external noise to within the recommended internal ambient noise level criteria.

6.3.1. External Wall Construction

Within all zones the external walls can be of a conventional construction comprising either masonry or light weight metal/timber frame.

- The masonry construction could comprise of at least two skins of block (one of density 1880 Kg/m³, 100mm cavity, 100mm block (density of 400 Kg/m³). Room side of the block work would be plastered or plasterboard on dabs. The existing construction is assumed to be at least this.
- The light weight construction could comprise of a single frame (minimum 100mm) construction with two layers of plasterboard internally (mass $\geq$ 20 kg/m²), external façade of brick slips or render on a weather board (mass $\geq$ 20 kg/m²) and 50 millimetre of mineral wool insulation within the cavity.

Table 8: Required minimum sound insulation performance of external walls

Type	Sound Reduction Index / dB per Octave Band (Hz)								R _w (dB)
	63	125	250	500	1k	2k	4k	8k	
Masonry	31	38	46	45	55	66	77	70	53
Lightweight	15	25	42	53	57	62	68	60	50

6.3.2. Window Construction

The windows on all elevations could be openable with an alternative form of ventilation provided. The windows should be constructed housed in sturdy and good quality frames with airtight compression seals.

The sound insulation performance for the windows should achieve the following as a minimum, a typical build up is also provided. The supplier should confirm the performance (octave band R and R_w) is achievable with the chosen systems. The performance is provided below:

Table 9: Required Minimum Sound Insulation of Windows

Zone	R dB per Octave Band (Hz)								R _w (dB)	Typical Construction
	63	125	250	500	1k	2k	4k	8k		
Zone A	21	26	27	34	40	38	46	46	37	10/12/6
Zone B	16	21	21	27	34	30	30	30	30	6/12/6
Zone C	16	21	21	27	34	30	30	30	30	6/12/6

6.4. Ventilation Provisions

There will be a need for suitable attenuated ventilation provisions to the habitable rooms in the red, blue and green zones.

6.4.1. Background Ventilation

The ventilation provisions should include the necessary sound attenuation in order that the ingress of external noise is controlled to be compatible with the building fabric. The supplier of any chosen ventilation product should provide test data confirming that the ventilation system meets the following performance data.

Table 10: Required D_{ne} of trickle vents

Zone	D_{ne} dB per Octave Band (Hz)								D_{new} (dB)	Typical Construction
	63	125	250	500	1k	2k	4k	8k		
Zone A	32	32	37	37	36	36	35	40	37	Trimvent 4000
Zone B	32	32	36	36	35	34	35	38	35	Trimvent 90
Zone C	30	30	30	30	30	30	30	30	30	Standard Trickle

6.4.2. Overheating Ventilation

It should be noted under overheating conditions the windows may need to be opened. Where this is the case the requirements of Approved Document O will need to be met.

On the basis that a partially open window achieves 15 dB attenuation, the predicted internal noise levels on all façades except Zone A meet the night-time overheating noise criteria of 40 dB $L_{Aeq,8hour}$ and 55 dB L_{AFmax} no more than 10 times.

This suggests no specific measures will be required to mitigate noise in overheating conditions except Zone A façade where mechanical means of cooling might be necessary, however it should be noted this is a relatively low volume traffic road and the passing of the vehicles is unlikely to adversely affect the dwellings when windows are open for overheating.

6.5. Effect of Mitigation Measures

Calculations for the internal ambient noise levels have been undertaken using the calculation method provided by Annex G of British Standard 8233:2014. The calculations have been undertaken using building façade constructions, ventilation measures, noise modelling and survey results.

With the mitigation measures installed to habitable rooms in the areas noted above, the predicted internal noise levels are below the BS8233 requirements and we would consider external noise ingress to be acceptable.

The predictions for night-time rooms under background ventilation on Zone A are below:

Figure 8: Noise Ingress, Zone A

Free Field Level at Façade - Zone A									
Octave Band	63	125	250	500	1000	2000	4000	8000	dBA
Day, $L_{eq}(6\text{ hour})$	60	59	58	57	53	50	45	38	59
Night $L_{eq}(8\text{ hour})$	54	51	47	45	43	41	36	30	48
Night-time $L_{max}(Fast)$	74	73	69	69	68	66	61	53	73
Building Façade Construction									
External Element	63	125	250	500	1000	2000	4000	8000	
Trimvent 4000 - 37 Dnew	D_{se}	31.5	32	37	37	36	36	35	40
	Number of	1							
		0.00042	0.00037	0.00013	0.00012	0.00014	0.00015	0.00020	0.00006
SFS - 69 dB Rw		26	45	59	72	79	71	80	70
	Area	8							
		0.00119	0.00001	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Double Glazed: 10/12/6 - 37 Rw		21	26	27	34	40	38	46	46
	Area	9							
		0.00419	0.00132	0.00105	0.00021	0.00005	0.00008	0.00001	0.00001
Calculations to BS EN 12354									
	63	125	250	500	1000	2000	4000	8000	
Sum	0.00537373	0.00138491	0.001051914	0.000209795	5.26967E-05	8.35467E-05	1.324E-05	1.32826E-05	
10log sum	-22.6972434	-28.73384401	-29.78019938	-36.78204107	-42.78216816	-40.78070515	-48.78110694	-48.76716297	
10log S/A	1.92673844	1.926738441	3.156770967	4.22207993	4.840619543	2.691881282	1.497520474	1.497520474	
correction factor +3	3	3	3	3	3	3	3	3	
Octave Band	63	125	250	500	1000	2000	4000	8000	dBA
Day, $L_{eq}(6\text{ hour})$	42.2	35.2	34.4	27.4	18.1	14.9	0.7	-6.3	29
Night $L_{eq}(8\text{ hour})$	36.2	27.2	23.4	15.4	8.1	5.9	-8.3	-14.3	19
Night-time $L_{max}(Fast)$	56.2	49.2	45.4	39.4	33.1	30.9	16.7	8.7	42

7. Noise Assessment for Commercial

The commercial occupiers are not currently known, as such, to ensure the development does not adversely affect the existing and proposed residential receivers, we would advise plant limits are set to control fixed plant noise.

Therefore, any plant associated with the development has potential to operate 24 hours a day. We have provided plant noise limits at the nearest noise sensitive dwellings based on the monitoring data obtained above and British Standards 4142:2014.

Based on the above criteria and operational hours, the maximum cumulative rating sound level limit of noise from plant associated with the development are as follows.

Table 11: Free-field Plant Rating Level limits

Location	Period	Plant Limits $L_{Ar,15min}$ dB
Dwellings along Hermitage Road	Day (07:00 - 23:00)	31
	Evening (19:00 - 23:00)	31
	Night (23:00 - 07:00)	26
Other Residential Premises	Day (07:00 - 23:00)	29
	Evening (19:00 - 23:00)	25
	Night (23:00 - 07:00)	24

The plant should be selected to ensure any character (tonality, intermittency or other sound characteristics) are not readily distinguishable at the dwellings. If character is present, a character correction should be applied as per BS4142:2014

8. Summary & Conclusions

Majorlink Limited appointed Acoustic Consultants Limited to provide a noise impact assessment for the proposed residential development at 167 Hermitage Road, Haringey. The development comprises of the demolition of the current buildings at the site and the erection of 2 new mixed-use buildings.

This report provides the results of a noise survey conducting on the site and an assessment of external sources of noise on the sensitive elements of the development.

Noise mitigation advice is provided in this report in the form of building façade constructions and ventilation provisions to the spaces of the scheme. With the proposed fabric construction and suitable ventilation provisions, the predicted internal noise levels due to external noise are within the British Standard 8233:2014 criteria.

The report also provides plant and construction limits that, if met, will satisfy the conditions of the relevant British Standards.

As such, we would consider that noise and vibration is suitably controlled and below the LOAEL of the NPPG internally to the development.

9. Appendix 1 – Glossary of Acoustic Terminology

A-weighted sound pressure p_A – value of overall sound pressure, measured in pascals (Pa), after the electrical signal derived from a microphone has been passed through an A-weighting network

A-weighted sound pressure level, L_{pA} – quantity of A-weighted sound pressure given by the following formula in decibels (dBA)

$$L_{pA} = 10 \log_{10} (p_A/p_0)^2$$

where:

p_A is the A-weighted sound pressure in pascals (Pa);
p₀ is the reference sound pressure (20 µPa)

Background sound level, L_{A90,T} – A-weighted sound pressure level that is exceeded by the residual sound assessment location for 90% of a given time interval, T, measured using weighting F and quoted to the nearest whole number of decibels

Break-in - noise transmission into a structure from outside.

Decibel (dB) – The decibel is the unit used to quantify sound pressure levels. The human ear has an approximately logarithmic response to acoustic pressure over a very large dynamic range (typically 20 micro-Pascals to 100 Pascals). Therefore, a logarithmic scale is used to describe sound pressure levels and also sound intensity and power levels. The logarithms are taken to base 10. Hence an increase of 10 dB in sound pressure level is equivalent to an increase by a factor of 10 in the sound pressure level (measured in Pascals). Subjectively, this increase would correspond to a doubling of the perceived loudness of sound.

Equivalent continuous A-weighted sound pressure level, L_{Aeq,T} – value of the A-weighted sound pressure level in decibels of continuous steady sound that, within a specified time interval, T = t₂ – t₁, has the same mean-squared sound pressure as a sound that varies with time, and is given by the following equation:

$$L_{Aeq,T} = 10 \log_{10} \left\{ (1/T) \int_{t_1}^{t_2} [p_A(t)^2/p_0^2] dt \right\} \quad (1)$$

where:

p₀ is the reference sound pressure (20 µPa); and

p_A(t) is the instantaneous A-weighted sound pressure (Pa) at time t

NOTE The equivalent continuous A-weighted sound pressure level is quoted to the nearest whole number of decibels.

Facade level – sound pressure level 1 m in front of the façade. Facade level measurements of L_{pA} are typically 1 dB to 3 dB higher than corresponding free-field measurements because of the reflection from the facade.

Free-field level – sound pressure level away from reflecting surfaces. Measurements made 1.2 m to 1.5 m above the ground and at least 3.5 m away from other reflecting surfaces are usually regarded as free-field. To minimize the effect of reflections the measuring position has to be at least 3.5 m to the side of the reflecting surface (i.e. not 3.5 m from the reflecting surface in the direction of the source).

Octave and Third Octave Bands – The human ear is sensitive to sound over a range of frequencies between approximately 20 Hz to 20 kHz and is generally more sensitive to medium and high frequencies than to low frequencies within the range. There are many methods of describing the frequency content of a noise. The most common methods split the frequency range into defined bands, in which the mid-frequency is used as the band descriptor and in the case of octave bands is double that of the band lower. For example, two adjacent octave bands are 250 Hz and 500 Hz. Third octave bands provide a fine resolution by dividing each octave band into three bands. For example third octave bands would be 160 Hz, 250 Hz, 315 Hz for the same 250 Hz octave band.

Sound pressure level – Sound pressure level is stated on many of the charts. It is the amplitude of the acoustic pressure fluctuations in a sound wave, fundamentally measured in Pascals (Pa), typically from 20 micro-Pascals to 100 Pascals, but commonly simplified onto the decibel scale.

Sound reduction index, R – laboratory measure of the sound insulating properties of a material or building element in a stated frequency band.

Specific sound level, $L_s = L_{Aeq,Tr}$ – equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, T_r .

Structure-borne noise – audible noise caused by the vibration of elements of a structure, the source of which is within a building or structure with common elements

Rating level, $L_{Ar,Tr}$ – Specific sound level plus any adjustment for the characteristic features of the sound.

Reverberation Time, T – The reverberation time is defined as the time taken for a noise level in an enclosed space to decay by 60 dB from a steady level, once the noise source has stopped. It is measured in seconds. Often a 60 dB decay cannot be measured so the reverberation time is measured over a lesser range and corrected back to the time for a 60 dB drop assuming a constant decay rate. Common parameters are T20 (time taken for a 20 dB decay multiplied by three) and T30 (time taken for a 30 dB decay multiplied by two).

Vibration Dose Value, VDV – measure of the total vibration experienced over a specified period of time.

Estimated Vibration Dose Value, $eVDV$ – estimation of the total vibration experienced over a specified period of time. This is usually based on the number of events and shortened measurement data.

Weighted sound reduction index, R_w – Single-number quantity which characterizes the airborne sound insulating properties of a material or building element over a range of frequencies. The weighted sound reduction index is used to characterize the insulation of a material or product that has been measured in a laboratory (see BS EN ISO 717-1).



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