

**7 CHEQUERS PARADE, LONDON, SE9 1DD**

**5th July 2023**

**ISSUE 01**



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<p>This report has been compiled by Deane Austin Ltd (DAA) with all reasonable skill, care and diligence in accordance with generally accepted acoustic consultancy principles. Information contained in this document contains confidential and commercially sensitive information and shall not be disclosed to third parties.</p>				

## 1.0 INTRODUCTION

DAA Group has been appointed to carry out a Noise Impact Assessment at 7 Chequers Parade, London, SE9 1DD to support a Prior Approval Planning Application for an Additional storey at third floor level to provide 1no self-contained flat in accordance with the Permitted Development legislation requirement allowing Local Planning Authorities to consider potential impacts of noise specifically from commercial premises on intended occupiers of residential developments.

Under Permitted Development legislation there is no requirement to consider noise from transport infrastructure type sources such as road traffic. Notwithstanding this, assessment of noise to the proposed change of use residential development in this report unavoidably includes noise from road traffic as being the principle and dominant source. This is provided as good practice, for completeness and as informative to the developer, rather than as being required by Permitted Development legislation.

Using results of the noise survey, the sound insulation performance for the whole building envelope including glazing (windows) is assessed, and a scheme of noise mitigation measures is established and included in the report verified by BS8233:2014 rigorous method building envelope sound insulation calculations.

A scheme of noise mitigation measures in the report provides specification details as appropriate for sound insulation upgrade treatment to the separating walls and separating floors.

The technical content of this assessment has been provided by a Tech member of the Institute of Acoustics.

The Institute of Acoustics is the UK's professional body for those working in acoustics, noise and vibration.

## 2.0 NOISE CRITERIA

### 2.1 NATIONAL PLANNING POLICY FRAMEWORK (NPPF)

The Department for Communities and Local Government introduced the National Planning Policy Framework (NPPF) in March 2012. The latest revision of the NPPF is dated July 2021.

The NPPF sets out the Government's planning policies for England and how these are expected to be applied. It provides a framework where local Councils can produce their own local and neighbourhood plans which reflect the needs of their communities.

In conserving and enhancing the natural environment, the planning system should prevent both new and existing development from contributing to, or being put at, unacceptable risk from environmental factors including noise.

Planning policies and decisions should aim to avoid noise giving rise to significant adverse impacts on health and quality of life as a result of new development. Conditions may be used to mitigate and

reduce noise to a minimum so that adverse impacts on health and quality of life are minimised. It must be recognised that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them. Reference is made within NPPF to the Noise Policy Statement for England (NPSE) as published by DEFRA in March 2021.

## 2.2 NOISE POLICY STATEMENT FOR ENGLAND (NPSE)

The long-term vision of the NPSE is stated within the documents scope, to 'promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development'. The policy aims are stated to:

- 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 application of NPSE should mean that noise is properly taken into account at the appropriate time (for example in planning applications or appeals) where it must be considered alongside other relevant issues. The guiding principles of Government policy on sustainable development should be used to assist in the implementation of the NPSE.

The NPSE should apply to all types of noise apart from occupational noise in the workplace. The types of noises defined in the NPSE includes:

- Environmental noise from transportation sources;
- Neighbourhood noise which includes noise arising from within the community; industrial premises, trade and business premises, construction sites and noise in the street

The Noise Policy Statement England (NPSE) outlines observed effect levels relating to the above, as follows:

- **NOEL – No Observed Effect Level**

- o 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**

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

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

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

As stated in The Noise Policy Statement England (NPSE), it is not currently possible to have a single objective based measure that defines SOAEL that is applicable to all sources of noise in all situations. Specific noise levels are not stated within the guidance for this reason, and allow flexibility in the policy until further guidance is available.

## 2.3 ProPG: PLANNING AND NOISE

As outlined above, the National Planning Policy Framework encourages improved standards of design, although it provides no specific noise levels which should be achieved on site for varying standards of acoustic acceptability, or a prescriptive method for the assessment of noise.



ProPG: Planning and Noise was published in May 2017 in order to encourage better acoustic design for new residential schemes in order to protect future residents from the harmful effects of noise. This guidance can be seen as the missing link between the current NPPF and its predecessor, PPG24 (Planning Policy Guidance 24: Planning and Noise), which provided a prescriptive method for assessing sites for residential development, but without the nuance of 'good acoustic design' as outlined in ProPG.

ProPG allows the assessor to take a holistic approach to consider the site's suitability, taking into consideration numerous design factors which previously may not have been considered alongside the noise level measured on site, for example the orientation of the building in relation to the main source of noise incident upon it.

It should be noted this document is not an official government code of practice, and neither replaces nor provides an authoritative interpretation of the law or government policy, and therefore should be seen as a good practice document only.

## 2.4 ACOUSTICS VENTILATION AND OVERHEATING

The AVO Guide includes:

- \* an explanation of ventilation requirements under the building regulations and as described in Approved Document F, along with typical ventilation strategies and associated noise considerations;
- \* an explanation of the overheating assessment methodology described in CIBSE TM59; potential acoustic criteria and guidance relating to different ventilation and overheating conditions, for both environmental noise ingress and building services noise;
- \* and a worked example of the application of the AVO Guide including indicative design solutions.

The AVO Guide is intended for the consideration of new residential development that will be exposed predominantly to airborne sound from transport sources, and to sound from mechanical services that are serving the dwellings in question. Although the policy coverage is limited to England, the approach may be applicable in other parts of the UK.

The AVO Guide is intended to contribute to the practice of good acoustic design, as emphasised in the Professional Practice Guidance on Planning and Noise (ProPG). In particular

**2.5 BRITISH STANDARD BS 8233:2014**

British Standard Code of Practice BS8233:2014 ‘Sound insulation and noise reduction for buildings’ provides recommended guideline value for internal noise levels within dwellings which are similar in scope to guideline values contained within the World Health Organisation Guidelines for Community Noise 1999 (WHO).

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living room	35 dB LAeq, 16hour	
Dining	Dining room/area	40 dB LAeq, 16hour	
Sleeping (daytime resting)	Bedroom	35 dB LAeq, 16hour	30 dB LAeq, 8hour

**2.4.1 Indoor ambient noise levels for dwellings**

The WHO guideline noise criteria set an internal sleep disturbance noise limit of 45dB LAmax,F which should not be exceeded on a regular basis.

### 3.0 SITE SURVEY

#### 3.1 SITE DESCRIPTION

The application site is a two-storey building fronting the pedestrianised Chequers parade. To the rear of the site is a parking area and residential units.

The area is a mix of residential and commercial properties, typical of an urban cityscape environment. The dominant noise source is traffic noise from the surrounding roads.

(See Figure 3.1)



Figure 3.1 – Proposed Site

#### 3.2 ENVIRONMENTAL SITE SURVEY PROCEDURE

In order to characterise the sound profile of the area an environmental sound survey has been carried out from 26/06/2023 to 27/06/2023. The monitoring position was chosen in order to collect representative data for the potential noise break into the habitable rooms.

Noise Measurements were carried out 1m from the rear and front façades on the first floor. The monitoring locations are shown in Figure 3.2.

Measurement Location 2 (MP2)



Figure 3.2 – Measurement Location

Measurement Location 1 (MP1)



### 3.3 EQUIPMENT

<b>Instrument manufacturer</b>	<b>Rion</b>
<b>Model</b>	<b>NA-28</b>
<b>Serial Number</b>	<b>00392485</b>
<b>Microphone Type</b>	<b>UC-59</b>
<b>Serial Number</b>	<b>14934</b>
<b>Calibrator</b>	<b>NC-74</b>
<b>Serial Number</b>	<b>34494274</b>
<b>Instrument manufacturer</b>	<b>Cirrus Research Plc</b>
<b>Model</b>	<b>IEC 61672-3:2013</b>
<b>Serial Number</b>	<b>G302987 – G303498</b>
<b>Microphone Type</b>	<b>MK:224</b>
<b>Serial Number</b>	<b>214457A</b>
<b>Cirrus CK: 675 Outdoor Kit</b>	
<b>Type 1 Acoustic Calibrator</b>	

The calibration of the sound level meters was verified in-situ before any measurements were taken, using the hand held calibrator and reference tone of 114dB at 1kHz. Validation checks at the end of the survey indicated that all instruments had operated within permitted tolerances for drift and measured level.

Copies of Calibration certificates are available upon request.

### 3.4 METEOROLOGICAL CONDITIONS

As the environmental noise survey was carried out over a long un-manned period no localized records of weather conditions were taken. However, during the set up and collection of the monitoring equipment, the weather conditions have been documented in the following table. All measurements have been compared with met office weather data of the area, specifically the closest weather station, the data from the weather station is outlined in the table below. When reviewing the time history of the noise measurements, any scenarios that were considered potentially to be affected by the local weather conditions have been omitted. The analysis of the noise data includes statistical and percentile analysis and review of minimum and maximum values, which aids in the preclusion of any periods of undesirable weather conditions. The weather conditions were deemed suitable for the measurement of environmental noise in accordance with BS7445 Description and Measurement of Environmental Noise. The table below presents the average temperature, wind speed and rainfall range for each 24-hour period during the entire measurement.

Weather Conditions Northolt Weather station				
Time Period	Air Temp ( °C)	Rainfall mm/h	Prevailing Wind Direction	Wind Speed (m/s)
26/06/2023 – 00:00 – 23:59	14 - 22	0.0	W	4-9
27/06/2023 – 00:00 – 23:59	18 - 24	0.0	W	5-9

Table 3.4 – Weather Summary

#### 4.0 NOISE SURVEY

The following free-field sound levels have been derived for assessment of environmental noise break-in. It shall be noted that the data is 3dB below the information in Appendix A to equate from façade to free-field conditions.

A maximum value is provided for each night-time measurement period. Based on the World Health Organisation interpretation that for a noise to be regular it needs to occur several (i.e. more than two) times per hour; the L<sub>AMAX</sub>(f) noise needs to be based upon an average of 10-15 events that are typical in nature. The aim of protecting against maximum noise levels is to ensure protection against typical intermittent noise levels rather than one-off events; whereby an arithmetic average of the 15 typical maximum events across each night period is used to determine values of dB L<sub>AMAX</sub>(f) reported below. Average LA<sub>eq</sub> levels and Representative LA<sub>90</sub> levels have been used for our calculations. These have been summarised in table 4.1 below.

Measurement Data		Free Field Sound Pressure Level dB		
		MP 1		
Time	LA <sub>eq,15</sub>	L <sub>AMAX,15</sub>	LA <sub>90,15</sub>	
07:00 – 23:00	52dB	74dB	48dB	
23:00 – 07:00	48dB	66dB	39dB	

Measurement Data		Free Field Sound Pressure Level dB		
		MP 2		
Time	LA <sub>eq,15</sub>	L <sub>AMAX,15</sub>	L <sub>90,15</sub>	
07:00 – 23:00	48dB	72dB	45dB	
23:00 – 07:00	39dB	57dB	36dB	

Table 4.1 - Measurement Levels

Leq, ff noise levels are taken as the continuous equivalent free-field sound pressure level outside the room elements under consideration. These correspond to the highest reliable readings taken for day and night periods.

Location	T	Time	Free-Field Sound Pressure Level Leq, T dB re.20µPa						
			125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	A
MP1	16h	Day	57	51	50	48	43	35	52
	8h	Night	53	47	46	44	39	31	48
		Max	71	65	64	62	57	49	66
MP2	16h	Day	53	47	46	44	39	31	48
	8h	Night	44	38	37	35	30	22	39
		Max	62	56	55	53	48	40	57

Table 4.2 Summary of Highest octave -band sound levels for break in assessment



## 5.1 EXTERNAL SOUND LEVELS

It shall be read from Table 4.2 in Section 4.0 of this report, that the external sound levels taken by means of average equivalent or maximum sound levels are within the World Health Organisation requirements for external noise as described by Community Noise Guidelines (1999) in Section 2.5 of this report in the daytime at the front façade.

### 5.1.1 Pro PG Acoustic Design Statement

The scope of ProPG is restricted to the consideration of new residential development that will be exposed predominantly to airborne noise from transport sources. New apartments, flats and houses are the most common type of new residential development, however the guidance can also be applied to other types of residential developments such as residential institutions, care homes etc. As such it is directly applicable to this development.

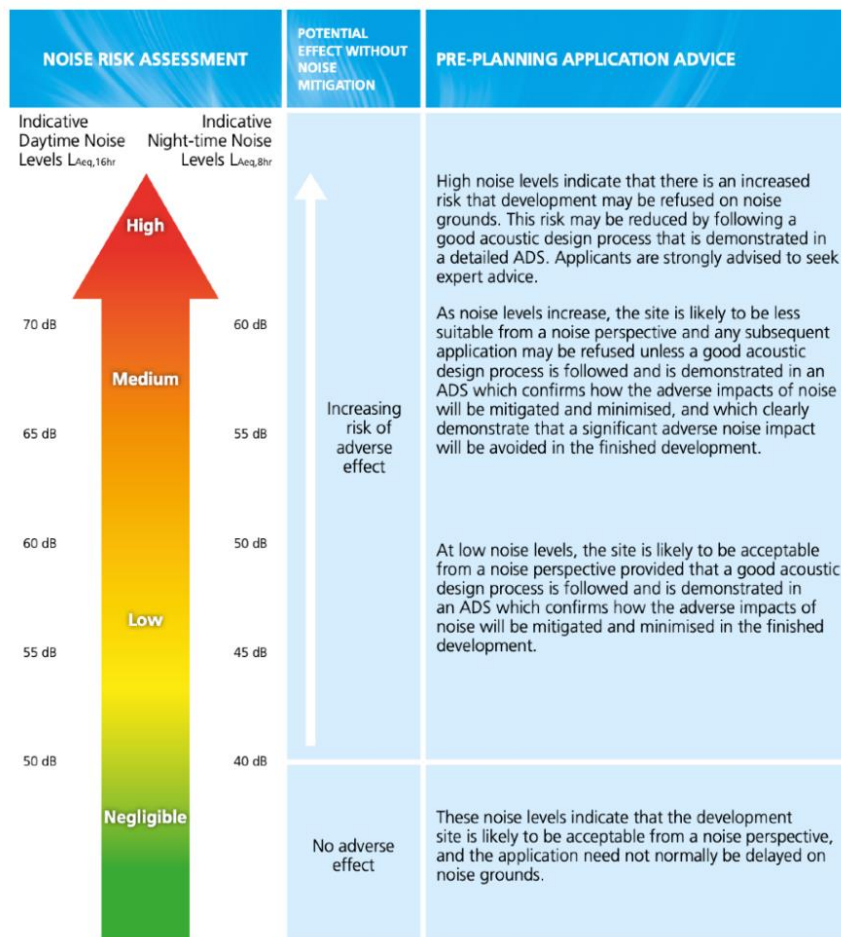


Figure 5.1 - ProPG Noise risk assessment guide

The following table assesses the ProPG noise risk for the measured data. The purpose of this is to provide a view of the noise risk at the site.

MP1	Daytime LAeq, 16hr 07:00 – 23:00	Night-time LAeq, 8hr 23:00 – 07:00
Noise Level	52dB	48dB
ProPG Noise Risk	LOW	LOW

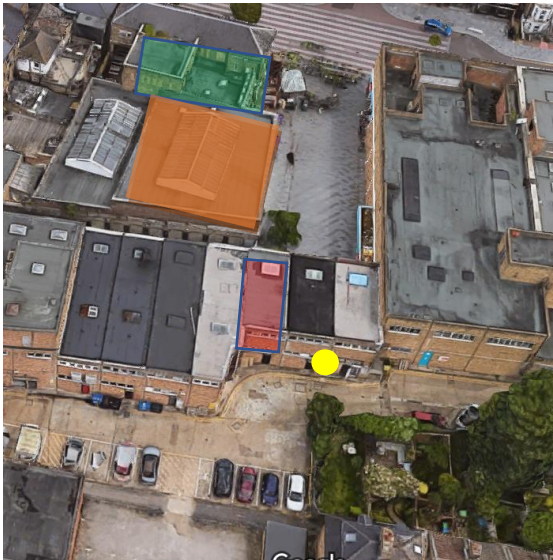
MP2	Daytime LAeq, 16hr 07:00 – 23:00	Night-time LAeq, 8hr 23:00 – 07:00
Noise Level	48dB	39dB
ProPG Noise Risk	LOW	LOW

Table 5.1.1 : ProPG Stage 1 Assessment table

ProPG states that “Particular care should be taken to ensure that any noise events (as quantified by LAmax,F) have been properly identified and assessed”.

### 5.1.2 ASSESSMENT OF COMMERCIAL SOURCES

Where a new noise-sensitive receptor is introduced and there is extant industrial and/or commercial sound, it ought to be recognized that the industrial and/or commercial sound forms a component of the acoustic environment. In such circumstances other guidance and criteria in addition to or alternative to BS4142:2014 can also inform the appropriateness of both introducing a new noise-sensitive receptor and the extent of required noise mitigation.” The observed commercial noise sources affecting the assessment areas are as follows:







	Proposed residential Units
	Public House
	Redundant Condenser Units
	Public House / Restaurant

Figure 5.1.2 – Commercial Noise Sources

The proposed residential units will be situated above a retail unit. Adjoining the site is an accountant and a pet shop.

On the rear elevation of the accountant is a condenser unit approximately 3 metres from the ground and 7 metres from the proposed Bedroom Window.







It was not operating on our attendance to the site and it was not possible to see the make/model. For our assessment we will be using a typical noise level of a condenser unit.

Adjacent to the site fronting Chequers Parade is a MMA Gym. There are no windows facing the proposed site. It was not possible to obtain the opening hours, but one would assume this will be operating during daytime hours.

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The Eltham GPO Public House is approximately 37 meters away from the site.

The operating hours are as follows:

Monday: 12pm - 11pm

Tuesday: 12pm - 11pm

Wednesday: 12pm - 11pm

Thursday: 12pm - 11pm

Friday: 12pm - 12am

Saturday: 12pm - 12am

Sunday: 12pm - 10:30pm

There is no plant adjacent to the site from the pub/gym that could be seen/ heard. The general commercial noise will be included in the noise measurements taken at MP1.

## 6.0 BS4142:2014+A1:2019 ASSESSMENT – 1m Outside Nearest residential Window

For existing plant, the methods described in BS4142:2014 result in the following formula:

$$L_b = 1 - \log [10^{(L_m/10)} - 10^{(L_f/10)}]$$

where

$L_b$  = background noise level when plant is removed

$L_m$  = background noise measured with plant running

$L_f$  = Specific noise of the fan

Character corrections should be added to the 'specific sound level' if it exhibits any tonality, impulsivity, other specific characteristics and/or intermittency at the assessment location. Based on the proposed window our measurements the plant was not tonal.

- Intermittency – We do not consider plant to have distinguishable intermittency.
- Impulsivity – Plant such as this is not normally impulsive.
- Other Sound Characteristics – we have applied a +3dB correction for other sound.

BS4142:2014 Assessment	
Source	Condenser Unit
Operating Period	07:00 – 23:00
Reference Time Interval (Tr)	15 minutes
Element	Level (dB)
Specific Sound Level	38
Representative Background Noise Level (LA90)	45
Acoustic feature correction	3
Rating Level	41
Excess of Rating over Background Sound Level	-4

Detailed calculations can be found in Appendix D.

## 6.1 DISCUSSIONS AND CONTEXT

BS4142 states: “Where the initial estimate of the impact needs to be modified due to the context, take all pertinent factors into consideration, including the following:

The sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions, such as:

- Façade sound insulation treatment
- Ventilation and/or cooling that will reduce the need to have windows open so as to provide rapid or purge ventilation
- Acoustic screening.” With regard to ‘good acoustic conditions’

“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 occur. 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.”

With a calculated Rating of -4dB over the background noise, this indicates a low impact on future occupants.

## 7.0 EXTERNAL BUILDING FABRIC SPECIFICATION

Sound reduction performance calculations have been undertaken in order to specify the minimum performance required from glazed and non-glazed elements in order to achieve the recommended internal noise levels shown in Table 2.5, taking into account average and maximum noise levels monitored during the environmental noise survey.

In accordance with the assessment guidance in Annex G of BS 8233:2014, the sound insulation performance of the building can be estimated by simple calculation from the free-field noise

564CALCULATION		A	B	(A-B) +5
Location	Period	Highest Free-Field Noise Levels LAeq,T dB	BS8233/WHO Internal Noise Guidance Criteria LAeq, T dB	Typical Insulation Specification dB Rw
MP1	Day 07:00 – 23:00	52	35	22
	Night 23:00 – 07:00	48	30	24
		66	45	26

MP2	Day 07:00 – 23:00	48	35	18
	Night 23:00 – 07:00	39	30	14
		57	45	17

Table 7.0 - Sound insulation estimate using the simple calculation method of BS8233

Typical sized bedrooms with a high ratio of glazing to masonry have been used for all calculations in order to specify glazing.

As a more robust assessment, L<sub>Amax</sub> spectrum values of night-time peaks have also been considered and incorporated into the glazing calculation in order to cater for the interior limit of 45 dB L<sub>Amax</sub> for individual events, as recommended in WHO Guidelines.

## 7.1 NON-GLAZED ELEMENTS

It is understood that the non glazed element is brickwork cavity walls and would be expected to provide the minimum figures shown above when tested in accordance with BS EN ISO, 140-3:1995.

Element	Octave Band Centre Frequency SRI, dB					
	125	250	500	1K	2K	4K
Non-Glazed Element SRI	41	43	48	50	55	55

Table 7.1 Non-glazed elements sound reduction minimum performance

## 7.2 SPECIFICATION OF GLAZED UNITS

The minimum sound reduction index (SRI) value required for the glazed elements is shown in Table 7.2

Glazing Configuration – 3mm/ 10mm cavity/3mm							
Frequency, Hz/dB					Rw	Rw + C	Rw +Ctr
125	250	500	1K	2K	29	-1	-4
14	19	24	31	41			

Table 7.2 – Required Glazing Performance

## 8.0 INTERNAL NOISE CRITERIA

Location	Monitoring Period	Noise Criteria L <sub>MAX</sub>	No. times exceeded L <sub>MAX</sub>
Living Area	07:00 – 23:00	55dB	5
Bedroom	23:00 – 07:00	45dB	1

Table 8.0 – Noise Criteria L<sub>MAX</sub>

Location	Monitoring Period	Noise Criteria L <sub>Aeq</sub>	Internal Noise Level
Living Area	07:00 – 23:00	35dB	32dB
Bedroom	23:00 – 07:00	30dB	12dB

Table 8.1 - Noise Criteria L<sub>Aeq</sub>

## 9.0 VENTILATION AND OVERHEATING

Guidance on ventilation and associated acoustic considerations is given in Acoustic Ventilation and Overheating – Residential Design Guide [AVO] issued jointly by the Association of Noise Consultants and the Institute of Acoustics. In this guide, the need for ventilation (as falls under the requirements of Approved Document F [ADF] are covered in three main requirements as follows:

- Whole Dwelling Ventilation - General ventilation – continuous ventilation of rooms or spaces at a relatively low rate
- Extract Ventilation - Removal of air from a space or spaces (typically stale air from bathrooms or kitchens) to outside
- Purge Ventilation - Manually controlled removal of air at a high rate to eliminate fumes and odours, e.g. during painting and decorating or from burnt food. May be provided by natural or mechanical means.

Four main template systems for providing each of the above ADF ventilation requirements are summarised in the AVO guide as shown in Table 9.0.

Ventilation System	Method Of Whole Dwelling Ventilation	Method of Extract Ventilation	Method of purge Ventilation
<b>System 1</b> (Background Ventilators and intermittent extract Fans)	Background ventilators (Trickle Vents)	Intermittent extract fans	Typically provided by opening windows
<b>System 2</b> (Passive Stack)	Background ventilators (Trickle Vents) & Passive Stack	Continuous via passive stack	Typically provided by opening windows
<b>System 3</b> (Continuous Mechanical Extract (MEV))	Continuous mechanical extract (low rate), trickle vents provide fresh air	Continuous mechanical extract (high rate), trickle vents provide fresh air	Typically provided by opening windows
<b>System 4</b> (Continuously mechanical supply and extract with heat recovery (MVHR))	Continuous mechanical supply and extract (low rate)	Continuous mechanical supply and extract (high rate)	Typically provided by opening windows

Table 9.0 – Summary of ADF Ventilation Requirements

Where possible, natural forms of ventilation are typically preferred. However, in high noise areas, it may be necessary to recommend System 4, in order to minimise penetrations through the external building façade, which weaken the overall sound reduction performance.

The Below Table outlines the appropriate ventilation strategies for this development.

Ventilation Strategy (according to ADF)	LIVING AREA	BEDROOM
System 1: Intermittent Extract Fans	✓	✓
System 2: Passive Stack Ventilation		
System 3: Continuous Mechanical Extract (MEV)	✓	✓
System 4: Continuous Mechanical Supply & Extract with Heat Recovery (MVHR)	✓	✓

Table 9.0.1 – Ventilation Options

Calculations were carried out using Titon Acoustic ventilators - V25 + C25. Details Below:

D <sub>n,e</sub> dB					
Frequency, Hz/dB					D <sub>n,e</sub>
125	250	500	1K	2K	<b>36</b>
36	38	36	32	37	

Table 9.0.2 - Required ventilator performance

It should be ensured that all mechanical extract ventilation is designed to not exceed the internal noise criteria stated in Table 2.4.1.

To stairwells, no specific acoustic measures would be necessary and standard trickle vents would be appropriate.

## 9.1 OVERHEATING

The advice in this section has considered the internal ambient noise level with closed windows. The AVO guide requires that consideration has also been given to the overheating condition. With an advocated and simplistic insertion loss of 13 dB from external to internal areas with an open window. It has been noted from the AVO guide, that a material change in behaviour may occur with internal ambient noise levels of > 50 dB LAeq, T (07:00 – 23:00) during the day, > 42 dB LAeq, T or > 65 dB LAmax(F) (23:00 – 07:00) during the night.

Level 1 Risk Assessment following the AVO Guide			Internal Ambient Noise Level dB re. 20µPa	
Location	Windows	Ventilation State	dB LAeq,T	Max dB LAeq,T
Living Area	Windows closed and ventilators open	Building Ventilation	32	
	Windows partially open	Overheating Ventilation	39	
Bedroom	Windows closed and ventilators open	Building Ventilation	12	30
	Windows partially open	Overheating Ventilation	26	44

Table 9.1 – IANL

BS8233:2014 states” . the internal target level may be relaxed by up to 5 dB and reasonable internal conditions still achieved”.



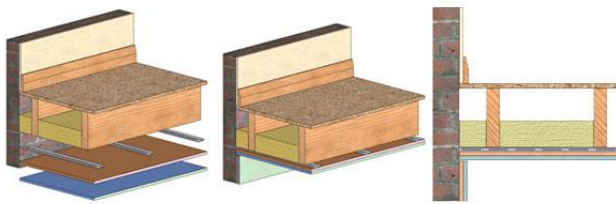
## 10.0 INTERNAL SOUND INSULATION ASSESSMENT

The floor and wall structure may be subject to pre-completion testing in accordance with requirements of The Building Regulations 2010 Approved Document E (2003 Edition & amendments). It should be expected that the proposed dwelling will exceed the minimum performance standards of the Regulations, as stipulated between dwellings in terms of dB DnT,w +Ctr.

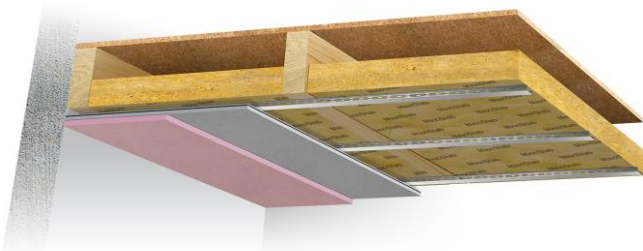
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## 10.1 PROPOSED FLOOR SYSTEM

Between Joists 100mm mineral wool 60kg/m<sup>3</sup> rigid slabs to be laid tight.



25mm Resilient bars to be installed and fitted with 2x layers 15mm Soundbloc Plasterboard with staggered joints.



Expected In-Situ Sound Insulation Performance: DnT,w + Ctr 48-53dB, L'nt,w 50-55dB



## 11.0 SUMMARY AND CONCLUSIONS

A baseline noise survey has been undertaken by DAA Group to establish the prevailing noise climate in the locality of 7 Chequers Parade, London, SE9 1DD in support of a Prior Approval Application for a proposed change of use to residential units in accordance with the Permitted Development legislation requirement allowing Local Planning Authorities to consider potential impacts of noise specifically from commercial premises on intended occupiers of residential developments.

Under Permitted Development legislation there is no requirement to consider noise from transport infrastructure type sources such as road traffic. Notwithstanding this, assessment of noise to the proposed change of use residential development in this report unavoidably includes noise from road traffic as being the principle and dominant source. This is provided as good practice, for completeness and as informative to the developer, rather than as being required by Permitted Development legislation.

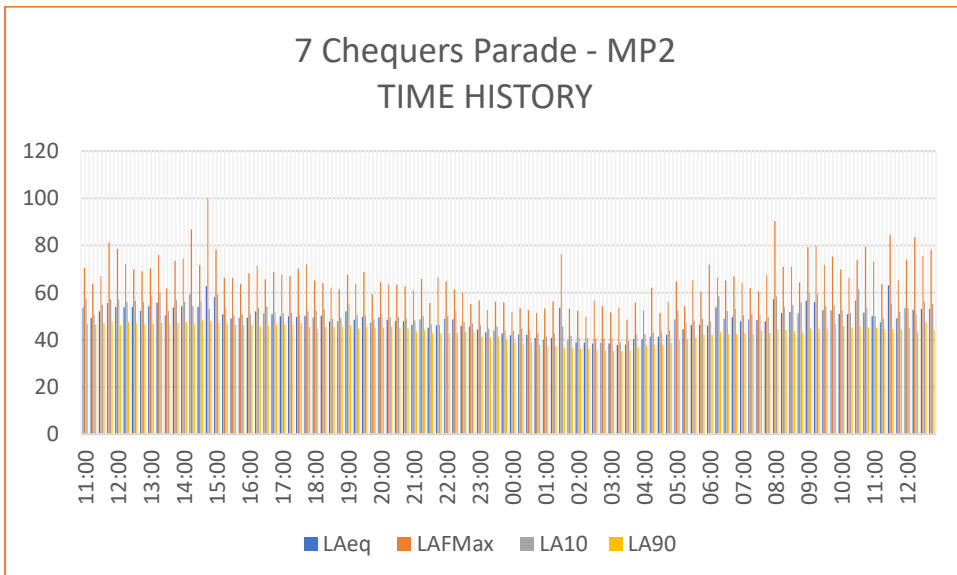
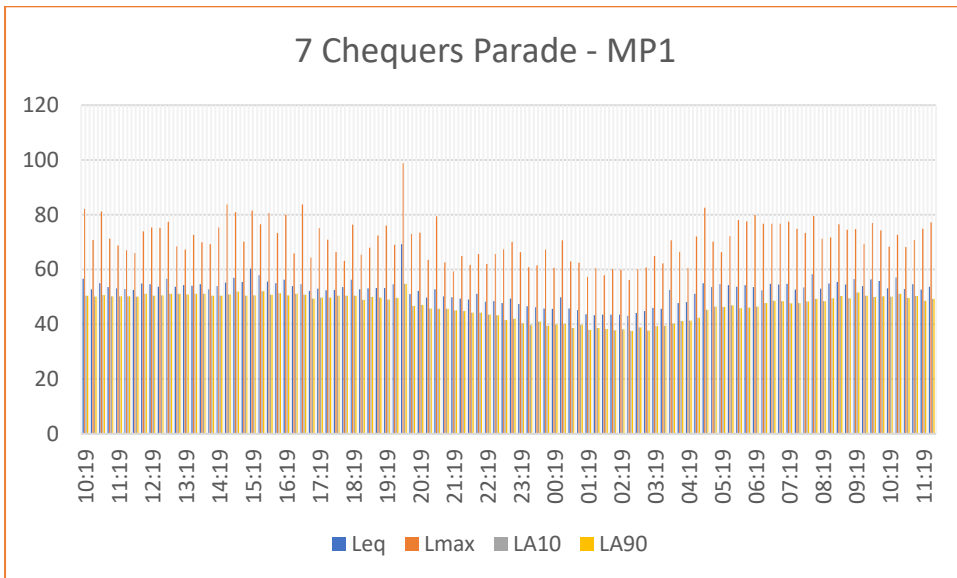
Using results of the noise survey, the sound insulation performance for the whole building envelope including glazing (windows) is assessed, and a scheme of noise mitigation measures is established and included in the report verified by BS8233:2014 rigorous method building envelope sound insulation calculations.

A scheme of noise mitigation measures in the report provides specification details as appropriate for sound insulation treatment to the separating floor.

A BS4142:2014+A1:2019 Assessment has been carried to assess the noise from the nearby existing commercial plant.

It is concluded that, the impact of noise from commercial premises will not prejudice the amenities of any future occupants provided the above points are taken into consideration.

**APPENDIX A – MEASUREMENTS**



## APPENDIX B - ACOUSTIC TERMINOLOGY

### B.1 WEIGHTED DECIBEL, dB(A)

The unit generally used for measuring environmental, traffic or industrial noise is the A-weighted sound pressure level in decibels, denoted dB(A). The weighting is based on the frequency response of the human ear and has been found to correlate well with human subjective reactions to various sounds. An increase or decrease of approximately 10 dB corresponds to a subjective doubling or halving of the loudness of a noise, and a change of 2 to 3 dB is subjectively barely perceptible.

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### B.2 EQUIVALENT CONTINUOUS SOUND LEVEL, LAeq

Another index for assessment for overall noise exposure is the equivalent continuous sound level, LAeq. This is a notional steady level which would, over a given period, deliver the same sound energy as the actual time-varying sound over the same period.

### B.3 MAXIMUM NOISE LEVEL, LAmax

The maximum noise level identified during a measurement period. Experimental data has shown that the human ear does not generally register the full loudness of transient sound events of less than 125 ms in duration.

### B.4 NOISE RATING, NR

Noise ratings are used as a single figure criterion for specifying services noise in buildings. Each noise rating value has an associated spectrum of defined values in each third or octave frequency band. To determine the noise rating of a room the measured spectrum is compared to a set of noise rating curves. The highest NR curve that crosses any single frequency band of the measurement determines the noise rating for the room.

The single figure noise rating is read at the 1 kHz band.

### B.5 SOUND LEVEL DIFFERENCE (D)

The sound insulation required between two spaces may be determined by the sound level difference needed between them. A single figure descriptor which characterises a range of frequencies, the weighted sound level difference, D, is sometimes used (BS EN ISO 717-1). This parameter is not adjusted to reference conditions.

The standardized level difference, Dn, T is a measure of the difference in sound level between two rooms, in each frequency band, where the reverberation time in the receiving room has been normalised to 0.5 s. This parameter measures all transmission paths, including flanking paths.

The weighted standardized level difference, DnTw, is a measure of the difference in sound level between two rooms, which characterises a range of frequencies and is normalised to a reference reverberation time

### B.6 SOUND REDUCTION INDEX (R)

The sound reduction index (or transmission loss) of a building element is a measure of the loss of sound through the material, i.e. its attenuation properties. It is a property of the component, unlike the sound level difference which is affected by the common area between the rooms and the acoustic of the receiving room. The weighted sound reduction index, Rw, is a single figure description of sound reduction index characterising a range of frequencies, which is defined in BS EN ISO 717-1: 1997. The Rw is calculated from measurements in an acoustic laboratory

**B.7 STATISTICAL NOISE LEVELS (LA90, (T) LA1, (T) LA10, (T) etc.)**

For levels of noise that vary widely with time, for example road traffic noise, it is necessary to employ an index which allows for this variation. The LA10 is the level exceeded for ten per cent of the time under consideration, has historically been adopted in the UK for the assessment of road traffic noise. The LA90 is the level exceeded for ninety per cent of the time, has been adopted to represent the background noise level. The LA1 the level exceeded for one per cent of the time, is representative of the maximum levels recorded during the sample period. A weighted statistical noise levels are denoted LA10, dB LA90, dB. etc. The reference time (T) is normally included, e.g. LA10, (5min), & LA90, (8hr).

**B.8 TYPICAL NOISE LEVELS**

Typical noise levels are given in the following table.

Noise Level dB(A)	Example
130	Threshold of pain
120	Jet aircraft take-offs at 100 m
110	Chain saw at 1 m
100	Inside disco
90	Heavy lorries at 5 m
80	Kerbside of busy street
70	Loud radio (in typical domestic room)
60	Office or restaurant
50	Domestic fan heaters at 1m
40	Living room
30	Ventilation Noise in Theatre
20	Remote countryside on still night
10	Sound insulated test chamber
0	Threshold of hearing.



APPENDIX C - CALCULATIONS

NOISE EMISSION CALCULATION													
ITEM	PARAMETER			HZ	63	125	250	500	1K	2K	4K	8K	dBA
1	Schedule of Plant	Qty											
2													
3	Typical Condenser Unit	1	Spl	dB +	65	57	54	53	50	47	41	34	55
4													
5													
6	Revised Spl:	1	Spl	dB +	65	57	54	53	50	47	41	34	55
7													
8													
9													
10													
11	Distance to nearest receptor Metres:	7		dB -	-17	-17	-17	-17	-17	-17	-17	-17	-17
12	$SPL=L1-20\log(r/D22)$	1											
13													
14													
15													
16	Spl at receptor			dB +	48	40	37	36	33	30	24	17	38
17													
18													
19	Noise correction	3.0		dB +	3	3	3	3	3	3	3	3	3
20													
21													
22													
23	Specific noise level at receptor			dB +	51	43	40	39	36	33	27	20	41
24	(1m outside noise sensitive window)												
25	Lowest Background Noise Levels: (L <sub>A90</sub> )												
26	Daytime (07:00 - 23:00)												45
27	Difference: (Assessment level)			dB -									-4
28													



**Calculation Sheet**  
MP1 - 07:00 - 23:00 to LR

	Octave Band Centre Frequency (Hz)								
	63	125	250	500	1k	2k	4k	8k	
<b>Noise Source</b>									
Noise Source - MP1 - 07:00 - 23:00									
Noise Levels	57.0	57.0	51.0	50.0	48.0	43.0	35.0	35.0	52.4 dBA
<b>Composite SRI</b>									
Facade Width (m)	4.0								
Facade Height (m)	3.0								
<b>Main Element - 29Rw</b>									
SRI	-	14	19	24	31	41	21	-	Rw 29
Window Width (m)	2.0								
Window Height (m)	1.0								
No. of Windows (no)	2.0								
<b>Glazed Element - 29Rw</b>									
SRI	-	14	19	24	31	41	21	-	Rw 29
No. of Vents (no)	2.0								
<b>Vent - Standard Vents</b>									
Dne	36	36	38	36	32	37	39	48	Dnew 36
	-	-14.0	-18.9	-23.6	-27.3	-33.9	-20.9	-	
<b>10 log (S/A)</b>									
Internal Receiver - LR	-	-1.1	-1.1	-1.1	-1.1	-1.1	-1.1	-	
+3	-	3.0	3.0	3.0	3.0	3.0	3.0	-	
<b>Internal Receiver Noise</b>									
Internal Receiver Noise - LR									
Reverberant Field, LPrev	-	44.9	34.0	28.3	22.6	11.0	16.0	-	32.3 dBA



Calculation Sheet  
MP2 23:00 - 07:00 to BR

	Octave Band Centre Frequency (Hz)							
	63	125	250	500	1k	2k	4k	8k
<b>Noise Source</b>								
Noise Source - MP2 23:00 - 07:00								
Noise Levels	44.0	44.0	38.0	37.0	35.0	30.0	22.0	22.0 39.4 dBA
<b>Composite SRI</b>								
Facade Width (m)	3.0							
Facade Height (m)	3.0							
<b>Main Element - External Wall</b>								
SRI	-	41	43	48	50	55	55	- Rw 51
Window Width (m)	1.0							
Window Height (m)	1.0							
No. of Windows (no)	1.0							
<b>Glazed Element - 29Rw</b>								
SRI	-	14	19	24	31	41	21	- Rw 29
No. of Vents (no)	1.0							
<b>Vent - Standard Vents</b>								
Dne	36	36	38	36	32	37	39	48 Dnew 36
	-	-23.2	-27.9	-31.3	-31.0	-36.3	-29.9	-
<b>10 log (S/A)</b>								
Internal Receiver - BR	-	-1.1	-1.1	-1.1	-1.1	-1.1	-1.1	-
+3	-	3.0	3.0	3.0	3.0	3.0	3.0	-
<b>Internal Receiver Noise</b>								
Internal Receiver Noise - BR								
Reverberant Field, L <sub>Prev</sub>	-	22.7	12.0	7.6	5.9	-4.4	-6.0	- 11.5 dBA

Calculation Sheet  
MP2 LAMAX to BR

	Octave Band Centre Frequency (Hz)							
	63	125	250	500	1k	2k	4k	8k
<b>Noise Source</b>								
Noise Source - MP2 LAMAX								
Noise Levels	62.0	62.0	56.0	55.0	53.0	48.0	40.0	40.0 57.4 dBA
<b>Composite SRI</b>								
Facade Width (m)	3.0							
Facade Height (m)	3.0							
<b>Main Element - External Wall</b>								
SRI	-	41	43	48	50	55	55	- Rw 51
Window Width (m)	1.0							
Window Height (m)	1.0							
No. of Windows (no)	1.0							
<b>Glazed Element - 29Rw</b>								
SRI	-	14	19	24	31	41	21	- Rw 29
No. of Vents (no)	1.0							
<b>Vent - Standard Vents</b>								
Dne	36	36	38	36	32	37	39	48 Dnew 36
	-	-23.2	-27.9	-31.3	-31.0	-36.3	-29.9	-
<b>10 log (S/A)</b>								
Internal Receiver - BR	-	-1.1	-1.1	-1.1	-1.1	-1.1	-1.1	-
+3	-	3.0	3.0	3.0	3.0	3.0	3.0	-
<b>Internal Receiver Noise</b>								
Internal Receiver Noise - BR								
Reverberant Field, L <sub>Prev</sub>	-	40.7	30.0	25.6	23.9	13.6	12.0	- 29.5 dBA





## Acoustic Performance

### Glazing Configuration

**3mm Float Glass**

10mm Cavity

**3mm Float Glass**

### Sound Reduction Indices

Frequency, Hz / dB						Rw	C	Ctr	OITC	STC
125	250	500	1000	2000	4000	29	-1	-4	23	28
14	19	24	31	41	21					

Disclaimer: The acoustic performance data provided in the reports is based on a test protocol or an estimation and may be used if user actual glazing is identical to input data described herein. Acoustic performance data herein is only applicable for glazing dimensions 1,23 m x 1,48 m (as per testing standard). Estimation of acoustic performance is based on component-similarity assumptions which are derived from measured data and interpolation to expand the database of values from test protocols. Due to inherent variations in acoustic performance when testing in accordance with EN ISO 10140-3/EN ISO 10140-2, some variation in the calculated performance can also be expected. As such, the weighted performance,  $R_w$ , and adaptation terms, C and Ctr, should typically be considered to be accurate within  $\pm 2$  dB. However, wider deviations can occur. Actual performance may vary according to the glazing dimensions, frame system, noise sources and many other parameters. The acoustic performance data herein should not be used as a substitute for tests of actual glazing. For more information please consult Assumptions and Terminology section in Guardian Acoustic Assistant. <P>By accessing this calculator, you agree not to alter or modify the generated report data and information, by any means. Any manual alteration will be your own responsibility and will annul all the content of the report.</P>

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