NOISE IMPACT ASSESSMENT

BS 8233:2014

Residential Development – Impact from Commercial Noise

NOISE ASSESSMENTS LTD

YOUR LOCAL ACOUSTIC SPECIALIST

REPORT DETAILS

Report Title	Residential Development – Impact from Commercial Noise
Site Address	16-18 Cambrian Rd, Newport, NP20 4AB
Project No.	NALPR170524.01
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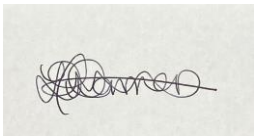
QUALITY ASSURANCE

Issue No.	Status	Issue Date	Comments	Author	Approved
1	Final	04/06/24			
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Contents

Assessment Summary

Noise Assessments Ltd was commissioned with the development at 16-18 Cambrian Rd, Newport, NP20 4AB (herein referred to as the site), to assess the impact of a Change Of Use of first and second floor from A1 To Residential Accommodation.

Planning permission is being sought from Newport City Council (NCC) and following consultations; a noise assessment has been requested to demonstrate current noise from the surrounding commercial sites/plant does not impact future residents in the new dwellings on each floor.

Commercial Noise at the Front of the Site

A noise survey was carried out at the site from location M1 for representative periods of the daytime and night-time.

The results demonstrate that, with windows open, internal LAeq and LAmax noise levels during the day and night-time within habitable rooms at the front of the development are expected to exceed the recommended target levels and openable windows cannot therefore be relied upon for ventilation for an extended period.

Internal Noise Levels in Habitable Rooms at the Front of the Site

Assuming the use of minimum 32 dB Rw+Ctr rated glazing (10/12/6mm) and 32 dB Dne,w+Ctr trickle ventilation (Trimvent Select Xtra S13), daytime road noise would be reduced from 58 dB LAeq,16hr to interior levels of 26 dB LAeq,16hr within habitable rooms. The assumed standard of construction would place the internal levels in habitable rooms below 35 dB, therefore within the desirable category.

Assuming the use of minimum 32 dB Rw+Ctr rated glazing (10/12/6mm) and 32 dB Dne,w+Ctr trickle ventilation (Trimvent Select Xtra S13), night-time road noise in bedrooms would be reduced from 54 dB LAeq,8hr to interior levels 22 dB LAeq,8hr with maximum individual noise events reduced from 76dB LAFmax to 44 dB LAFmax, therefore within the desirable category.

No external amenity spaces are proposed for the development.

Commercial/Plant Noise at the Rear of the Site

Burlesque's has been identified with having four Panasonic/ Mitsubishi Condenser units 2 metres away from the rear façade of the building. We have completed an assessment based on all units running at the same time as it could not be confirmed if all are in use.

It should be noted that the client has plans to replace one unit with a quieter model in due course, as part of the conversion.

Environmental noise levels were measured on site 28th to 29th May 2024.

The lowest daytime background sound level was measured between 14:30-19:45 as 41 dB LA90,15min.

The lowest daytime background sound level was measured between 03:45-04:00 as 39 dB LA90,15min.

The specific sound level may be corrected for certain characteristics that make a sound more noticeable at the NSR locations. Corrections for tonality, impulsivity and intermittency may be applied.

The units have an associated intermittency due to them being turned on and off.

The noise impact during the daytime is tabulated below:

Noise Impact

NSR	Rating Level, dB L_{Ar}	Difference, dBA	Impact
1	64	23	*Significant Adverse Impact*

The noise impact during the night-time is tabulated below:

Noise Impact

NSR	Rating Level, dB L_{Ar}	Difference, dBA	Impact
1	64	25	*Significant Adverse Impact*

Significant Adverse *Impact* has been identified at the façade of the site.

Internal Noise Levels in Habitable Rooms

Based on the commercial noise in the area, the results demonstrate that, with windows open, internal LAeq and LAmax noise levels during the daytime and night-time within habitable rooms on the first to second floors at the rear of the development are expected to exceed the recommended target levels from time to time, and openable windows cannot therefore be relied upon for background ventilation for an extended period. However, windows can be relied upon for purge ventilation, as required.

Double glazed windows are installed to the rear elevation with 10mm outer pane, 12mm cavity, and 6mm inner pane. This achieves above the minimum 32dB Rw+Ctr rating. Assuming the use of 32 dB Dne,w+Ctr trickle ventilation (Trimvent Select Xtra S13) for background ventilation, daytime environmental noise would be reduced from 64 dB LAeq,16hr to interior levels of 32 dB LAeq,16hr within habitable rooms. The assumed standard of construction would place the internal levels in habitable rooms below 35 dB, therefore within the desirable category.

Assuming the use of minimum 32 dB Rw+Ctr rated glazing (10/12/6mm) and 32 dB Dne,w+Ctr trickle ventilation (Trimvent Select Xtra S13), night-time road noise in bedrooms would be reduced from 64 dB LAeq,8hr to interior levels 32 dB LAeq,8hr with maximum individual noise events reduced from 64dB LAFmax to 32 dB LAFmax, therefore within the desirable category.

No external amenity spaces are proposed for the development.

In Summary

A noise intrusion assessment has demonstrated that, via the adoption of the proposed glazing and ventilation strategy internal noise levels and floor or ceiling upgrades within proposed habitable rooms at the rear and front of the site are consistent with the guide values outlined in BS 8233 and by the WHO. Products with higher acoustic performance specifications may be utilised if desired.

The assessment includes a means of ventilation to provide occupants with the ability to maintain adequate background ventilation rates for heating and cooling without having to rely entirely on openable windows.

1. Proposal

1.1 Noise Assessments Ltd was commissioned with the development at 16-18 Cambrian Rd, Newport, NP20 4AB (herein referred to as the site), to assess the impact of a Change Of Use Of First And Second Floor From A1 To Residential Accommodation.

1.2 Planning permission is being sought from Newport City Council (NCC) and following consultations; a noise assessment has been requested to demonstrate current noise from the surrounding commercial sites/plant does not impact future residents in the new dwellings on each floor.

Existing Context

1.3 The site is in a commercial area, with residential apartments located nearby, with a main shopping high street of Cambrian Rd along the front of the site. There is also a public house and night club nearby.

2. Noise Policy and Guidance

Planning Policy Wales

2.1 Planning Policy Wales (PPW) is the current planning policy guidance within Wales. The planning guidance defines the primary objective of the document in paragraph 1.2 as follows:

> '…to ensure that the planning system contributes towards the delivery of sustainable development and improves the social, economic, environmental and cultural well-being of Wales…'

2.2 In particular reference to noise Paragraph 6.7.3 of the PPW states:

> 'Problematic forms of sound are generally experienced as noise pollution and can affect amenity and be prejudicial to health or a nuisance. Noise action plans drawn up by public bodies aim to prevent and reduce noise levels where necessary and preserve soundscape quality where it is good. Noise levels used to identify priority areas contained in noise actions plans are usually set quite high in order to focus resources on the most polluted areas and noise must meet a number of tests before it qualifies as a statutory nuisance. Lower levels of noise however, can still be annoying or disruptive and impact on amenity and as such should be protected through the planning process wherever necessary.'

Technical Advice Note 11: Noise (TAN 11)

2.3 TAN 11 is used to categorise noise levels for proposed residential developments. TAN 11 presents four noise exposure categories (NECs), ranging from A to D, where A represents the lowest noise levels, and D is for sites with higher noise levels. A breakdown of the NECs, and subsequent advice is provided below in Table 1 and 2.

Table 1: Noise exposure categories for road traffic noise and mixed sources[1]				
Time	**Noise Exposure Category**			
	A	**B**	**C**	**D**
0700-2300	<55	55 - 63	63 - 72	>72
2300-0700[2]	<45	45 - 57	57 - 66	>66

Footnote
(1) Noise levels: the noise level(s) (LAeq,T) used when deciding the NEC of a site should be representative of typical conditions.
(2) Night-time noise levels (2300-0700): sites where individual noise events regularly exceed 82dBLAmax (S time weighting) several times in any hour should be treated as being in NEC C, regardless of the LAeq,8H (except where the LAeq,8H already puts the site in NEC D).

Table 2: Advice relating to noise exposure category		
NEC	**Significance**	**Advice**
A	Negligible	Noise need not be considered as a determining factor in granting planning permission, although the noise level at the high end of the category should not be regarded as desirable.
B	Minor	Noise should be taken into account when determining planning applications and, where appropriate, conditions imposed to ensure an adequate level of protection.
C	Moderate	Planning permission should not normally be granted. Where it is considered that permission should be given, for example, because there are no alternative quieter sites available, conditions should be imposed to ensure a commensurate level of protection against noise.
D	Major	Planning permission should normally be refused.

2.4 TAN 11 also states that:

> "This note provides advice on how the planning system can be used to minimise the adverse impact of noise without placing unreasonable restrictions on development."

Technical Guidance

BS 8233:2014 Guidance on sound insulation and noise reduction for buildings

2.5 This British Standard was published in February 2014 and supersedes BS 8233:1999, which is withdrawn.

2.6 This Standard provides guidance for the control of noise in and around buildings and is applicable to the design of new buildings, or refurbished buildings undergoing a change of use, but does not provide guidance on assessing the effects of changes in the external noise levels to occupants of an existing building.

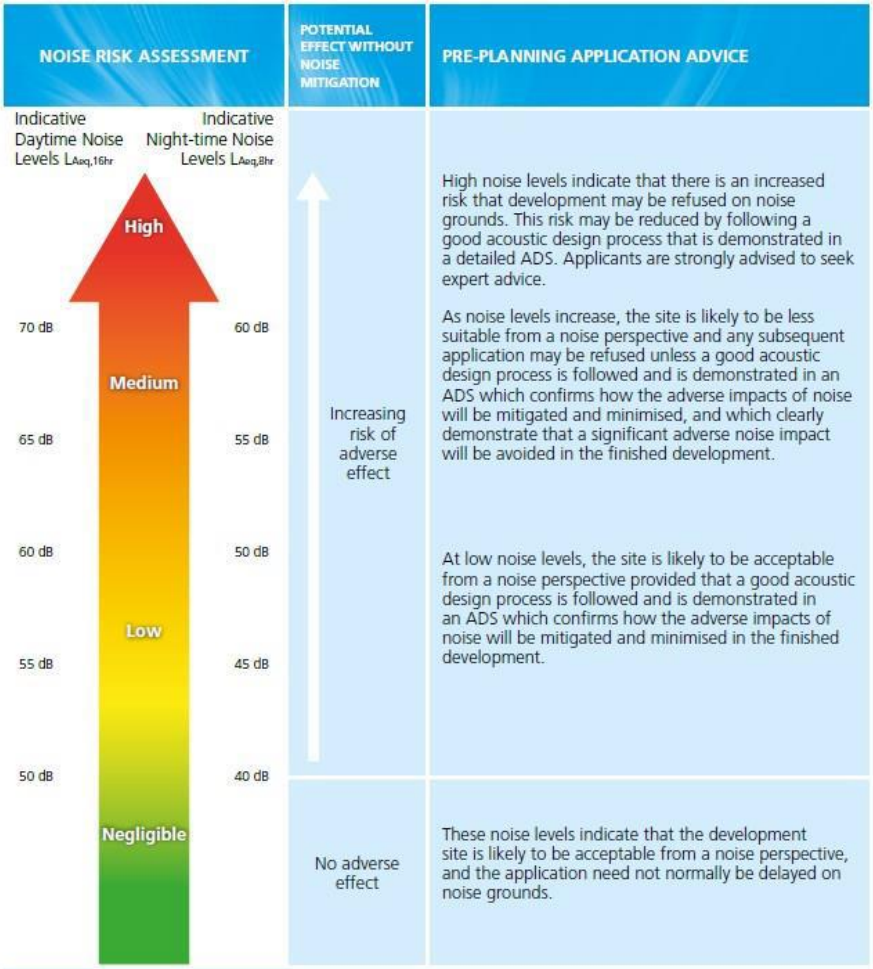


Figure 1 Notes:

a. Indicative noise levels should be assessed without inclusion of the acoustic effect of any scheme specific noise mitigation measures.

b. Indicative noise levels are the combined free-field noise level from all sources of transport noise and may also include industrial/commercial noise where this is present but is "not dominant".

c. $L_{Aeq,16hr}$ is for daytime 0700 – 2300, $L_{Aeq,8hr}$ is for night-time 2300 – 0700.

d. An indication that there may be more than 10 noise events at night (2300 – 0700) with $L_{AmaxF} > 60$ dB means the site should not be regarded as negligible risk.

2.7 For dwellings, the main considerations are:

- for bedrooms, the acoustic effect on sleep; and
- for other rooms, the acoustic effect on resting, listening and communicating.

2.8 It is desirable that the internal ambient noise level does not exceed the following guideline values.

Activity	**Location**	**07:00 – 23:00**	**23:00 – 07:00**
Resting	Living room	35 dB $L_{Aeq,16hour}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16hour}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$

2.9 For traditional external areas that are used for amenity space, such as gardens, it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments.

2.10 However, it is also recognized that these external noise guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited.

2.11 When determining the sound insulation of a building envelope, the requirements should be determined on the basis of the assessment of:

- the level and characteristics of the noise outside the building
- the design noise levels in the rooms and other spaces of the building

2.12 Initial estimates may be obtained using calculations based on single-figure data, however, for detailed noise intrusion calculations to be undertaken, knowledge or assumptions of the following are required.

- Frequency characteristics of the noise source(s).
- Frequency characteristics of the sound reducing elements.
- Surface area of the common construction separating the two areas.
- Reverberation time of the receiving space.

World Health Organisation (WHO)

2.13 The World Health Organisation '*Guidelines for Community Noise*' 1999 aims to provide environmental health authorities and professionals with guidance on the adverse health effects of community noise on people.

2.14 This document presents a summary of research and opinions on the impacts of noise and recommends guideline values for avoidance of particular effects e.g. annoyance and sleep

disturbance. It is the primary reference point for other guidance value based documents, such as BS 8233.

2.15 The following guideline values have been derived according to specific environments. The values relevant to residential development are shown in the table below.

Specific Environment	**Critical Health Effect(s)**	**L_{Aeq} (dB)**	**Time base (hrs)**	**$L_{Amax,f}$ (dB)**
Outdoor living area	Serious annoyance, daytime and evening	55	16	-
	Moderate annoyance, daytime and evening	50	16	-
Dwelling, indoors	Speech intelligibility and moderate annoyance, daytime and evening	35	16	
Inside bedrooms	Sleep disturbance, night-time	30	8	45

2.16 The above values are consistent with those recommended within BS 8233, however unlike BS 8233:2014, the WHO guidelines present a specific guide value for L_{Amax} levels affecting bedrooms. The research suggests that sleep disturbance effects have been observed at individual L_{Amax} exposures of 45 dB or less. Consequently, it is important to limit the number of individual noise events with a L_{Amax} exceeding 45 dB.

AVO: Acoustics, Ventilation and Overheating Residential Design Guide

2.17 The AVO guide recommends an approach to acoustic assessments for residential development that takes into consideration the interdependence of provisions for acoustics, ventilation and overheating. The application of the AVO Guide is intended to demonstrate good acoustic design in accordance with ProPG. A two-stage assessment approach is advised as:

- Stage 1: Site Risk Assessment
- Stage 2: Detailed Assessment of Adverse Effect

2.18 The guide provides a means of assessment to satisfy the need to consider acoustics, ventilation and overheating at the planning stage. It also assists in educating clients, environmental health officers, planning officers and other stakeholders of the interdependence of design for acoustics, ventilation and overheating.

BS4142:2014– Method for Rating & Assessing Industrial and Commercial Sound

2.19 BS4142:2014 – Methods for rating and assessing industrial and commercial sound' is a recognised standard for assessing the noise impact of fixed plant machinery via relation of noise emissions to current background noise levels.

3. Subjective Impressions

3.1 The noise climate in and around the site is dominated by people chatting along Cambrian Rd at the front of the site, and commercial unit in the form for several condenser units to the rear of the site. The site forms part of a mainly commercial area.

4. Measurement Location

4.1 Noise monitoring equipment for measuring sound levels was set up to capture daytime and night-time noise on 28th to 29th and 31st May 2024. The location of the measurement position is shown in Figure 1.

4.2 The data collected during this period has been used to characterise the existing acoustic environment at the proposed development site.

4.3 Measurement and site location are shown in figure 1 below:

Figure 1: Site & Measurement Location

Measurement location M1

Measurement location M2

Site location

5. Measurement Procedure

5.1 Noise levels were measured from the 28th to the 29th and 31st May 2024. Full measurement times and durations can be found in **Appendix A**.

6. Measurement Equipment

6.1 Measurements were undertaken using a calibrated, Pulsar N45 class 1 sound level meters. Full equipment details can be found in **Appendix B.**

6.2 Measurements at the monitoring locations were 'free field' (no vertical reflective surfaces within 3.5 metres of the microphone) and at a height of between 1.2 – 1.5 metres above ground level. During all measurements the microphone was protected with an outdoor windshield.

6.3 The calibration level of the meters was checked before and after the survey with a sound calibrator with no variation in the levels observed.

6.4 The sound level meter was set to measure various noise parameters including LAeq and LAmax values using a 'fast' time weighting.

6.5 Full calibration details can be found in **Appendix C**.

7. Weather Conditions

7.1 Weather conditions were deemed acceptable for noise measurement. Full meteorological conditions are detailed in **Appendix D**.

8. Noise Survey at the Front of the Site

9. Noise Survey

9.1 A noise survey was conducted on the 28th to the 29th and 31st May 2024. For the purposes of the assessment the loudest 16hr day and 8hr night were selected and are tabulated below.

Measurement Summary				
Measurement	**Date**	**Period**	**LAeq (dB)**	**LAFmax (dB)**
M1	28/05/24	Day (16hr)	**58**	N/A
	29/05/24	Night (8hr)	44	73
	31/05/24	Day (16hr)	57	N/A
	01/06/24	Night (8hr)	**54**	**76**

10. BS8233:2014 Noise Assessment

Noise Level Calculations

10.1 The noise intrusion levels with windows closed have been determined using the methodology outlined in Annex G.2 of BS 8233 and a number of assumptions regarding potential construction details for various elements of the building envelope. Detailed proposed internal layouts are available (**Appendix F**) and therefore the dimensions of external facades, windows, and ceiling areas used in the calculations have been taken from these plans.

10.2 The sound reduction indices (SRI) of the assumed elements comprising the building envelope are presented below. The SRI data is presented as guidance only and alternatives with equivalent or better acoustic performance specifications may be utilised if required.

10.3 Based on the recommended glazing and ventilation specification, example calculations have been provided for a representative bedroom and living space. Noise intrusion levels with windows open have been determined assuming that the insulation provided by a window, partially open for ventilation, is 15 dB as suggested by BS 8233 and WHO.

10.4 Noise intrusion levels with windows closed have been determined assuming that the insulation provided by a window open.

Noise Levels in External Amenity Areas

10.5 No external amenity areas are provided with this development.

11. Noise level Calculations

11.1 Noise intrusion levels with windows have been determined assuming that the insulation provided by a window open.

Parameter	Measured External Free-Field Noise Level at facade	Internal Noise Level with Windows Open for Ventilation	Internal Noise Level with Windows Closed and Vents Open	ProPG Guidance	BS 8233 Classification
Living Space					
Daytime $L_{Aeq,16hr}$ (dB)	58 (TAN:B)	43	**26**	**Low Risk of Adverse Effects**	**Desirable** (≤35)
Bedrooms					
Daytime $L_{Aeq,16hr}$ (dB)	58 (TAN: B)	43	**26**	**Low Risk of Adverse Effects**	**Desirable** (≤35)
Bedrooms					
Night-time $L_{Aeq,8hr}$ (dB)	54 (TAN:B)	39	**22**	**Low Risk of Adverse Effects**	**Desirable** (≤30)
Night-time $L_{Amax(f)}$ (dB)	76	61	**44**	**Low Risk of Adverse Effects**	**Desirable** (≤45)

AVO – Stage 1 Overheating Risk Assessment

11.2 In January 2020 the Acoustics Ventilation and Overheating: Residential Design Guide (AVO) was published by the Association of Noise Consultants. Therefore, the risk of overheating within proposed dwellings can be considered in line with the AVO guide.

11.3 In accordance with AVO, the noise levels across the proposed development site as described in the table above have been compared to the Level 1 risk assessment shown in Table 3.2 of AVO, to establish the potential risk of an overheating condition.

11.4 The table above indicates that site will be subject to a 'Medium' risk of an overheating condition during the daytime during periods of high volumes of traffic. Therefore, mitigation is considered necessary and discussed below.

Assessment of TAN 11 Noise Exposure Categories

11.5 The noise results show that during the daytime the site falls within Category B, noise should be taken into account when determining planning applications and where appropriate, conditions imposed to ensure adequate level of protection.

11.6 The noise results show that during the night-time the site falls within category B., noise should be taken into account when determining planning applications and where appropriate, conditions imposed to ensure adequate level of protection.

Assessment of Daytime Noise Levels in Living Rooms and Bedrooms

11.7 The results demonstrate that, with windows open, internal LAeq and LAmax noise levels during the day and night-time within habitable rooms at the front of the development are expected to exceed the recommended target levels and openable windows cannot therefore be relied upon for ventilation for an extended period.

11.8 The assessment suggests that an alternative means of ventilation is required to provide occupants with the ability to maintain adequate background ventilation rates without having to rely entirely on openable windows. Care should be taken not to confuse a reliance on closed windows to achieve the noise level criteria with the need to have sealed glazing units. Windows may remain openable for rapid or purge ventilation, or at the occupant's choice.

11.9 In situations where there is a reliance on closed windows to meet the guide value, there needs to be an appropriate alternative means of ventilation that does not compromise the façade insulation or the resulting internal noise level. Typically trickle ventilators can be used and sound attenuating types are available.

11.10 The following is a list of manufacturers and suppliers of ventilation products.

Rytons
http://rts.vents.co.uk/blog/products/background-ventilators/

Titon
https://www.titon.com/uk/products/ventilation-systems/window-vents/

R.W.Simon Ltd
https://www.rwsimon.co.uk/products/window-ventilation/

Greenwood
https://www.greenwood.co.uk/window-vents

Internal Noise Levels in Habitable Rooms at the Front of the Site

11.11 Assuming the use of minimum 32 dB Rw+Ctr rated glazing (10/12/6mm) and 32 dB Dne,w+Ctr trickle ventilation (Trimvent Select Xtra S13), daytime road noise would be reduced from 58 dB LAeq,16hr to interior levels of 26 dB LAeq,16hr within habitable rooms. The assumed standard of construction would place the internal levels in habitable rooms below 35 dB, therefore within the desirable category.

11.12 Assuming the use of minimum 32 dB Rw+Ctr rated glazing (10/12/6mm) and 32 dB Dne,w+Ctr trickle ventilation (Trimvent Select Xtra S13), night-time road noise in bedrooms would be

reduced from 54 dB LAeq,8hr to interior levels 22 dB LAeq,8hr with maximum individual noise events reduced from 76dB LAFmax to 44 dB LAFmax, therefore within the desirable category.

BS4142:2014 Assessment from the Rear of the Site

12. Noise Survey

12.1 A noise survey was conducted at monitoring location M2 on 28th to the 29th of May 2024 to understand the potential noise impact from commercial activity at the rear of the site.

Various Commercial Condenser Units

12.2 Burlesque's has been identified with having four Panasonic/ Mitsubishi Condenser units 2 metres away from the rear façade of the building. We have completed an assessment based on all units running at the same time as it could not be confirmed if all are in use.

12.3 It should be noted that the client has plans to replace one unit with a quieter model in due course, as part of the conversion.

12.4 The noise level of the units was provided by the manufacturer.

12.5 The calculated unit noise level is tabulated below:

AC Unit Noise Levels

Equipment	r, m	dBA
4x condenser units	1.0	67

12.6 The specific sound level is denoted LAs and is the A-weighted, equivalent noise level at the NSR location over the reference time period.

12.7 Full calculations are shown in Appendix H.

12.8 The specific sound level is summarised below:

Specific Sound Levels

NSR	Specific Sound Level, dB L_{As}
1 (2m)	61

12.9 Environmental noise levels were measured on site 28th to the 29th May 2024.

12.10 The lowest daytime background sound level was measured between 14:30-19:45 as 41 dB LA90,15min.

12.11 The lowest daytime background sound level was measured between 03:45-04:00 as 39 dB LA90,15min.

12.12 The specific sound level may be corrected for certain characteristics that make a sound more noticeable at the NSR locations. Corrections for tonality, impulsivity and intermittency may be applied.

12.13 The units have an associated intermittency due to them being turned on and off.

12.14 The associated rating penalties and resultant sound rating levels, dB LAr, are tabulated below:

Rating Penalties, dB, and Sound Rating Levels

NSR	dB L_{As}	Tonality	Impulsivity	Intermittency	dB L_{Ar}
1	61	0	0	3	64

12.15 The rating level is to be compared to the background sound level to determine the resultant noise impact in accordance with BS4142:

> A Sound Rating Level at or below the background noise level is indicative of *Low Impact;*
>
> A Sound Rating Level that exceeds the background noise level by around + 5dB is likely an indication of *Adverse Impact*, depending on the context;
>
> A Sound Rating Level that exceeds the background noise level by around + 10dB is likely an indication of *Significant Adverse Impact*, depending on the context;

12.16 The noise impact during the daytime is tabulated below:

Noise Impact

NSR	Rating Level, dB L_{Ar}	Difference, dBA	Impact
1	64	23	*Significant Adverse Impact*

12.17 The noise impact during the night-time is tabulated below:

Noise Impact

NSR	Rating Level, dB L_{Ar}	Difference, dBA	Impact
1	64	25	*Significant Adverse Impact*

12.18 Significant Adverse *Impact* has been identified at the façade of the site.

13. Noise level Calculations

13.1 Noise intrusion levels with windows open have been determined assuming that the insulation provided by a window, partially open for ventilation, is 15 dB as suggested by BS 8233 and WHO.

Parameter	Manufacturer External Free-Field Noise Level at facade	Internal Noise Level with Windows Open	Internal Noise Level with Windows Closed and Vents Open	ProPG Guidance	BS 8233 Classification
Living Space					
Daytime $L_{Aeq,16hr}$ (dB)	64	49	32	**Low Risk of Adverse Effects**	**Desirable** (≤35)
Bedrooms					
Daytime $L_{Aeq,16hr}$ (dB)	64	49	32	**Low Risk of Adverse Effects**	**Desirable** (≤35)
Bedrooms					
Night-time $L_{Aeq,8hr}$ (dB)	64	49	32	**Low Risk of Adverse Effects**	**Desirable** (≤30)
Night-time $L_{Amax(f)}$ (dB)	64	49	32	**Low Risk of Adverse Effects**	**Desirable** (≤45)

Assessment of TAN 11 Noise Exposure Categories

13.2 The noise results show that during the daytime the site falls within Category C. i.e. planning permission should not normally be granted, conditions should be imposed to ensure a commensurate level of protection against noise.

13.3 The noise results show that during the night-time the site falls within category C. i.e. planning permission should not normally be granted, conditions should be imposed to ensure a commensurate level of protection against noise.

Internal Noise Levels in Habitable Rooms

13.4 Based on the general commercial noise in the area, the results demonstrate that, with windows open, internal LAeq and LAmax noise levels during the daytime and night-time within habitable rooms on the ground to first floors at the rear of the development are expected to exceed the

recommended target levels from time to time, and openable windows cannot therefore be relied upon for background ventilation for an extended period. However, windows can be relied upon for purge ventilation, as required.

13.5 Double glazed windows are installed to the rear elevation with 10mm outer pane, 12mm cavity, and 6mm inner pane. This achieves above the minimum 32dB Rw+Ctr rating. Assuming the use of 32 dB Dne,w+Ctr trickle ventilation (Trimvent Select Xtra S13) for background ventilation, daytime environmental noise would be reduced from 64 dB LAeq,16hr to interior levels of 32 dB LAeq,16hr within habitable rooms. The assumed standard of construction would place the internal levels in habitable rooms below 35 dB, therefore within the desirable category.

13.6 Assuming the use of minimum 32 dB Rw+Ctr rated glazing (10/12/6mm) and 32 dB Dne,w+Ctr trickle ventilation (Trimvent Select Xtra S13), night-time road noise in bedrooms would be reduced from 64 dB LAeq,8hr to interior levels 32 dB LAeq,8hr with maximum individual noise events reduced from 64dB LAFmax to 32 dB LAFmax, therefore within the desirable category.

AVO – Stage 1 Overheating Risk Assessment

13.7 In January 2020 the Acoustics Ventilation and Overheating: Residential Design Guide (AVO) was published by the Association of Noise Consultants. Therefore, the risk of overheating within proposed dwellings can be considered in line with the AVO guide.

13.8 In accordance with AVO, the noise levels across the proposed development site as described in the table above have been compared to the Level 1 risk assessment shown in Table 3.2 of AVO, to establish the potential risk of an overheating condition.

13.9 The table above indicates that site will be subject to a 'Medium' risk of an overheating condition during the daytime during periods of high volumes of traffic. Therefore, mitigation is considered necessary and discussed below.

Assessment of Daytime Noise Levels in Living Rooms and Bedrooms

13.10 The results demonstrate that, with windows open, internal LAeq and LAmax noise levels during the day and night-time within habitable rooms at the rear of the development on all floors are expected to exceed the recommended target levels and openable windows from time to time cannot therefore be relied upon for ventilation for an extended period.

13.11 The assessment suggests that an alternative means of ventilation is required to provide occupants with the ability to maintain adequate background ventilation rates without having to rely entirely on openable windows. Care should be taken not to confuse a reliance on closed windows to achieve the noise level criteria with the need to have sealed glazing units. Windows may remain openable for rapid or purge ventilation, or at the occupant's choice.

13.12 In situations where there is a reliance on closed windows to meet the guide value, there needs to be an appropriate alternative means of ventilation that does not compromise the façade

insulation or the resulting internal noise level. Typically trickle ventilators can be used and sound attenuating types are available.

13.13 The following is a list of manufacturers and suppliers of acoustic ventilation products.

Rytons
http://rts.vents.co.uk/blog/products/background-ventilators/

Titon
https://www.titon.com/uk/products/ventilation-systems/window-vents/

R.W.Simon Ltd
https://www.rwsimon.co.uk/products/window-ventilation/

Greenwood
https://www.greenwood.co.uk/window-vents

14. Summary

14.1 Noise Assessments Ltd was commissioned with the development at 16-18 Cambrian Rd, Newport, NP20 4AB (herein referred to as the site), to assess the impact of a Change Of Use of first and second floor from A1 To Residential Accommodation.

14.2 Planning permission is being sought from Newport City Council (NCC) and following consultations; a noise assessment has been requested to demonstrate current noise from the surrounding commercial sites/plant does not impact future residents in the new dwellings on each floor.

Commercial Noise at the Front of the Site

14.3 A noise survey was carried out at the site from location M1 for representative periods of the daytime and night-time.

14.4 The results demonstrate that, with windows open, internal LAeq and LAmax noise levels during the day and night-time within habitable rooms at the front of the development are expected to exceed the recommended target levels and openable windows cannot therefore be relied upon for ventilation for an extended period.

Internal Noise Levels in Habitable Rooms at the Front of the Site

14.5 Assuming the use of minimum 32 dB Rw+Ctr rated glazing (10/12/6mm) and 32 dB Dne,w+Ctr trickle ventilation (Trimvent Select Xtra S13), daytime road noise would be reduced from 58 dB LAeq,16hr to interior levels of 26 dB LAeq,16hr within habitable rooms. The assumed standard of construction would place the internal levels in habitable rooms below 35 dB, therefore within the desirable category.

14.6 Assuming the use of minimum 32 dB Rw+Ctr rated glazing (10/12/6mm) and 32 dB Dne,w+Ctr trickle ventilation (Trimvent Select Xtra S13), night-time road noise in bedrooms would be reduced from 54 dB LAeq,8hr to interior levels 22 dB LAeq,8hr with maximum individual noise events reduced from 76dB LAFmax to 44 dB LAFmax, therefore within the desirable category.

14.7 No external amenity spaces are proposed for the development.

Commercial/Plant Noise at the Rear of the Site

14.8 Burlesque's has been identified with having four Panasonic/ Mitsubishi Condenser units 2 metres away from the rear façade of the building. We have completed an assessment based on all units running at the same time as it could not be confirmed if all are in use.

14.9 It should be noted that the client has plans to replace one unit with a quieter model in due course, as part of the conversion.

14.10 Environmental noise levels were measured on site 28th to 29th May 2024.

14.11 The lowest daytime background sound level was measured between 14:30-19:45 as 41 dB LA90,15min.

14.12 The lowest daytime background sound level was measured between 03:45-04:00 as 39 dB LA90,15min.

14.13 The specific sound level may be corrected for certain characteristics that make a sound more noticeable at the NSR locations. Corrections for tonality, impulsivity and intermittency may be applied.

14.14 The units have an associated intermittency due to them being turned on and off.

14.15 The noise impact during the daytime is tabulated below:

Noise Impact

NSR	Rating Level, dB L_{Ar}	Difference, dBA	Impact
1	64	23	*Significant Adverse Impact*

14.16 The noise impact during the night-time is tabulated below:

Noise Impact

NSR	Rating Level, dB L_{Ar}	Difference, dBA	Impact
1	64	25	*Significant Adverse Impact*

14.17 Significant Adverse Impact has been identified at the façade of the site.

Internal Noise Levels in Habitable Rooms

14.18 Based on the commercial noise in the area, the results demonstrate that, with windows open, internal LAeq and LAmax noise levels during the daytime and night-time within habitable rooms on the first to second floors at the rear of the development are expected to exceed the recommended target levels from time to time, and openable windows cannot therefore be relied upon for background ventilation for an extended period. However, windows can be relied upon for purge ventilation, as required.

14.19 Double glazed windows are installed to the rear elevation with 10mm outer pane, 12mm cavity, and 6mm inner pane. This achieves above the minimum 32dB Rw+Ctr rating. Assuming the use of 32 dB Dne,w+Ctr trickle ventilation (Trimvent Select Xtra S13) for background ventilation,

daytime environmental noise would be reduced from 64 dB LAeq,16hr to interior levels of 32 dB LAeq,16hr within habitable rooms. The assumed standard of construction would place the internal levels in habitable rooms below 35 dB, therefore within the desirable category.

14.20 Assuming the use of minimum 32 dB Rw+Ctr rated glazing (10/12/6mm) and 32 dB Dne,w+Ctr trickle ventilation (Trimvent Select Xtra S13), night-time road noise in bedrooms would be reduced from 64 dB LAeq,8hr to interior levels 32 dB LAeq,8hr with maximum individual noise events reduced from 64dB LAFmax to 32 dB LAFmax, therefore within the desirable category.

14.21 No external amenity spaces are proposed for the development.

In Summary

14.22 A noise intrusion assessment has demonstrated that, via the adoption of the proposed glazing and ventilation strategy internal noise levels and floor or ceiling upgrades within proposed habitable rooms at the rear and front of the site are consistent with the guide values outlined in BS 8233 and by the WHO. Products with higher acoustic performance specifications may be utilised if desired.

14.23 The assessment includes a means of ventilation to provide occupants with the ability to maintain adequate background ventilation rates for heating and cooling without having to rely entirely on openable windows.

Appendices

APPENDIX A - Measurement Details

Measurement	Start Date	Start Time	End Date	End Time
M1/M2	28/05/24	10:30	29/05/24	10:30

APPENDIX B - Equipment Details

Equipment	Make	Model	Class	Serial Number
Sound Meter	Pulsar	N45	1	1365
Calibrator	Pulsar	PM1	1	011121C

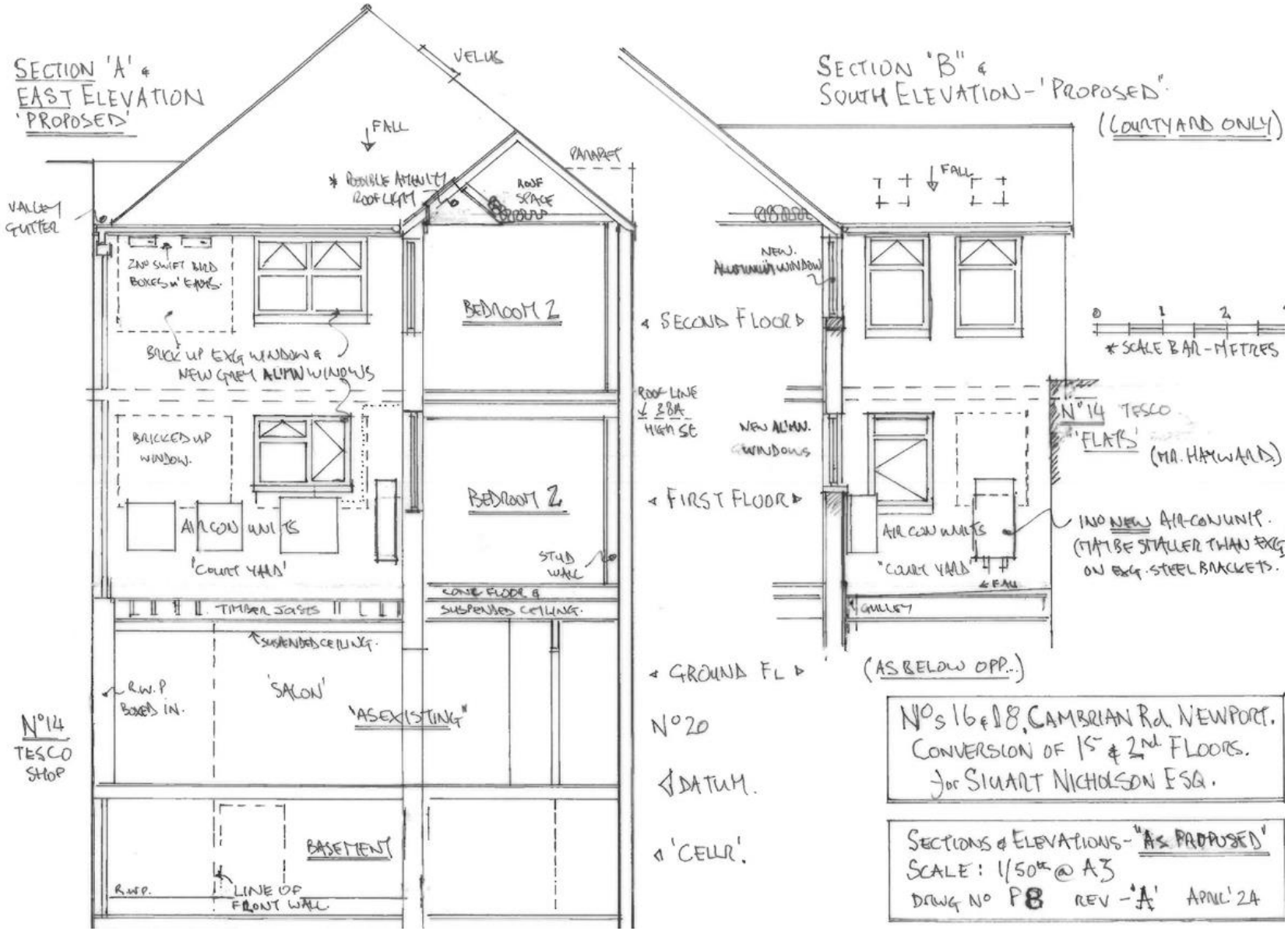
APPENDIX C - Calibration Details

Measurement	Calibrator Ref Level (dB)	Level Before (dB)	Deviation Before (dB)	Level After (dB)	Deviation After (dB)
M1/M2	94.0	94.0	0	94.0	0

APPENDIX D - Meteorology Details

Date	Temp C	Wind Speed m/s*	Wind Direction	Humidity %	Precipitation mm	Cloud Cover (Oktas)
28/05/24	17	2.3	SW	81	0.1	2/8

APPENDIX E – Layout Drawings


SECTION 'A' & EAST ELEVATION 'PROPOSED'
VELUX
FALL
PARAPET
* POSSIBLE AMENITY ROOF LIGHT
ROOF SPACE
VALLEY GUTTER
2NO SWIFT BIRD BOXES W' EAVES.
BACK UP EXG WINDOW & NEW GREY ALUM WINDOWS
BEDROOM 2
BRICKED UP WINDOW.
AIRCON UNITS
'COURT YARD'
STUD WALL
BEDROOM 2
CONC FLOOR & SUSPENDED CEILING.
TIMBER JOISTS
SUSPENDED CEILING.
R.W.P
BOXES IN.
'SALON'
'AS EXISTING'
N°14 TESCO SHOP
BASEMENT
R.W.P.
LINE OF FRONT WALL
SECTION 'B' & SOUTH ELEVATION - 'PROPOSED'
(COURTYARD ONLY)
FALL
NEW ALUMINIUM WINDOW
SECOND FLOOR
SCALE BAR - METRES
ROOF LINE ↓ 2BR HIGH SE
NEW ALUM. WINDOWS
N°14 TESCO
'FLATS'
(MR. HAYWARD)
FIRST FLOOR
AIR CON UNITS
2NO NEW AIR-CON UNIT. (MAY BE SMALLER THAN EXG ON EXG. STEEL BRACKETS.
"COURT YARD"
FALL
GALLEY
GROUND FL
(AS BELOW OPP.)
N°20
DATUM.
'CELL'.
N°s 16 & 18, CAMBRIAN Rd. NEWPORT.
CONVERSION OF 1ST & 2ND FLOORS.
for STUART NICHOLSON ESQ.
SECTIONS & ELEVATIONS - "AS PROPOSED"
SCALE: 1/50TH @ A3
DRWG N° P8 REV - 'A' APRIL '24

APPENDIX F – BS8233 Rigorous Design Calculation example

BS8233:2014 Specification Calculation Summary

Bedroom - night time

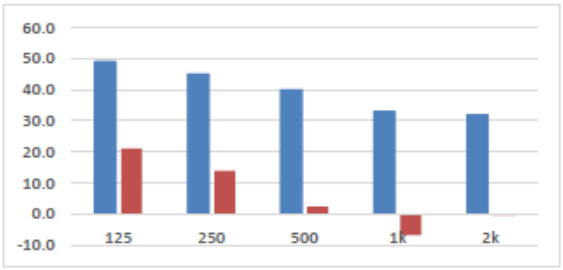
Room Properties

Room Width (m)	3.0
Room Depth (m)	4.0
Room Height (m)	2.4
Glazed Area (m^2)	1.8
Is dwelling within roof?	☒

Sound Insulation Properties

Freq. Hz	125	250	500	1k	2k
Wall, dB R_{w+Ctr}	41	45	45	54	58
Roof, dB R_{w+Ctr}	41	45	45	54	58
Glazing, dB R_{w+Ctr}	26	27	34	40	38
Vents, $D_{n,e,w+Ctr}$	34	38	43	42	34

Noise Levels, dB



External Level	42 dB LAeq
Internal Level	9 dB LAeq
Insertion Loss	33 dB LAeq

Sound Insulation Requirement

	Minimum Sound Insulation Requirement		Suitable Systems
Glazing	32	dB R_{W+Ctr}	Double Glazing *10/12/6mm*
Ventilation	40	$D_{n,e,w+Ctr}$	Acoustically treated trickle vent *Titon Xtra Sound Attenuator V75+C50*

Technical Calculations

Frequency, Hz	125	250	500	1k	2k
Term 1	0.000553	0.00022	7E-05	8.8E-05	0.00055
Term 2	0.000628	0.0005	1E-04	2.5E-05	4E-05
Term 3	5.96E-05	2.4E-05	2.4E-05	3E-06	1.2E-06
Term 4	0	0	0	0	0
Internal, dB L_{eq}	21.1	13.8	2.4	-6.8	-0.5
Internal, dB LAeq	5.0	5.2	-0.8	-6.8	0.7

Façade Components

Roof	Not Within Roof Space
Glazing	Double Glazing
Vents	Acoustically treated trickle vent

Calculations conducted in accordance with BS8233:2014 rigorous calculation method

$$\ldots \left(A_{\ldots} \ldots S_{\ldots} \ldots S_{\ldots} \ldots S \ldots \right) \ldots (S)$$

Suitable systems gives as reference only. Other products that achieve the required sound insulation values are available.

APPENDIX G – Condenser Noise Attenuation

Utilising Measured Levels

Equipment	Manufacture provided, dBA	r_1 , m	r_2 , m	Barrier	Level at NSR_2
4x condenser units	67	2	1.0	-	61 (NSR1)

Point source distance attenuation

$$L_y = 20 \times \log \frac{r_1}{r_2}$$

Where L_y is the distance attenuation factor and $r_{1,2}$ are the source -> measurement distance and source -> NSR distance in metres respectively

APPENDIX H Terminology and Definitions

Noise
Sound only becomes noise (often defined as 'unwanted sound' or sound that is considered undesirable or disruptive) when it causes or contributes to some harmful or otherwise unwanted effect, like annoyance or sleep disturbance.

Acoustic Environment
Sound from all sound sources as modified by the environment.

Equivalent continuous A-weighted sound pressure level LAeq,T

Value of the A-weighted sound pressure level of a continuous, steady sound that, within a specified time interval T, has the same mean square sound pressure as a sound under consideration whose level varies with time.

A-weighting
The human ear is most sensitive to frequencies in the range 1 kHz to 5 kHz. On each side of this range the sensitivity falls off. A-weighting is used in sound level meters to replicate this sensitivity and respond in the same way as the human ear.

Octave Band
Band of frequencies in which the upper limit of the band is twice the frequency of the lower limit.

Maximum Sound Pressure Level LAmax,T
Highest value of the A-weighted sound pressure level with a specified time weighting that occurs during a given event or measuring period.

The LA10,T Sound Level
The A-weighted sound pressure that is exceeded for 10% of a given time interval, T. It is often used to evaluate road traffic noise.

The LA90,T Sound Level
The A-weighted sound pressure that is exceeded for 90% of a given time interval, T, measured using time weighting F. It is often referred to as the background noise level and which might in part be an indication of relative quietness at a given location

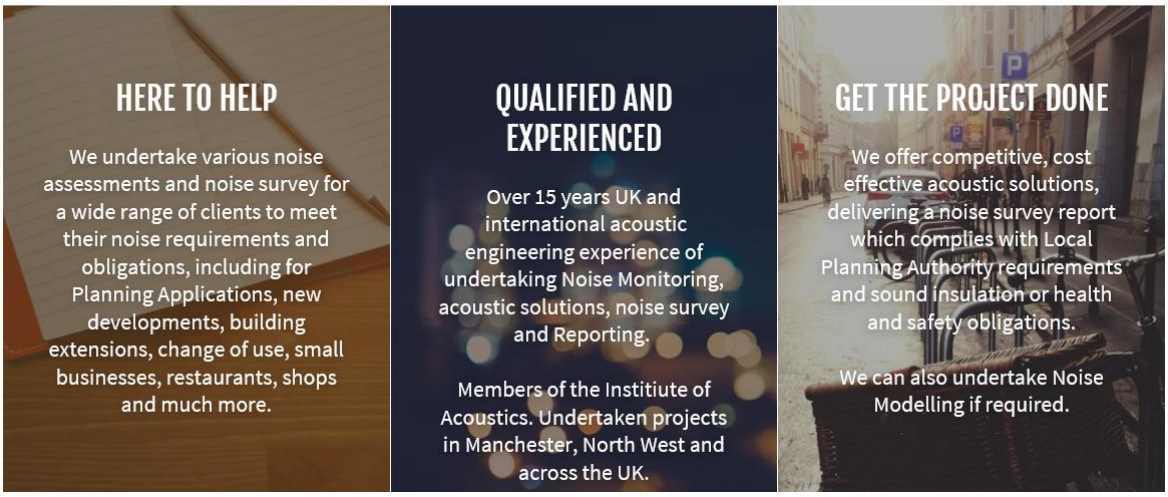
Free-field Level
The sound pressure level away from reflecting surfaces.
NOTE Measurements made 1.2 m to 1.5 m above the ground and at least 3.5 m away from other reflecting surfaces are usually regarded as free-field. To minimize the effect of reflections the

measuring position has to be at least 3.5 m to the rear of the reflecting surface (i.e. not 3.5 m from the reflecting surface in the direction of the source).

Façade Level
The sound pressure level 1 m in front of the façade.
NOTE Facade level measurements of LpA are typically 1 dB to 2 dB higher than corresponding free-field measurements because of the reflection from the facade.

Indoor Ambient Noise
Noise in a given situation at a given time, usually composed of noise from many sources, inside and outside the building, but excluding noise from activities of the occupants.

ABOUT US


HERE TO HELP
We undertake various noise assessments and noise survey for a wide range of clients to meet their noise requirements and obligations, including for Planning Applications, new developments, building extensions, change of use, small businesses, restaurants, shops and much more.
QUALIFIED AND EXPERIENCED
Over 15 years UK and international acoustic engineering experience of undertaking Noise Monitoring, acoustic solutions, noise survey and Reporting.
Members of the Instituite of Acoustics. Undertaken projects in Manchester, North West and across the UK.
GET THE PROJECT DONE
We offer competitive, cost effective acoustic solutions, delivering a noise survey report which complies with Local Planning Authority requirements and sound insulation or health and safety obligations.
We can also undertake Noise Modelling if required.