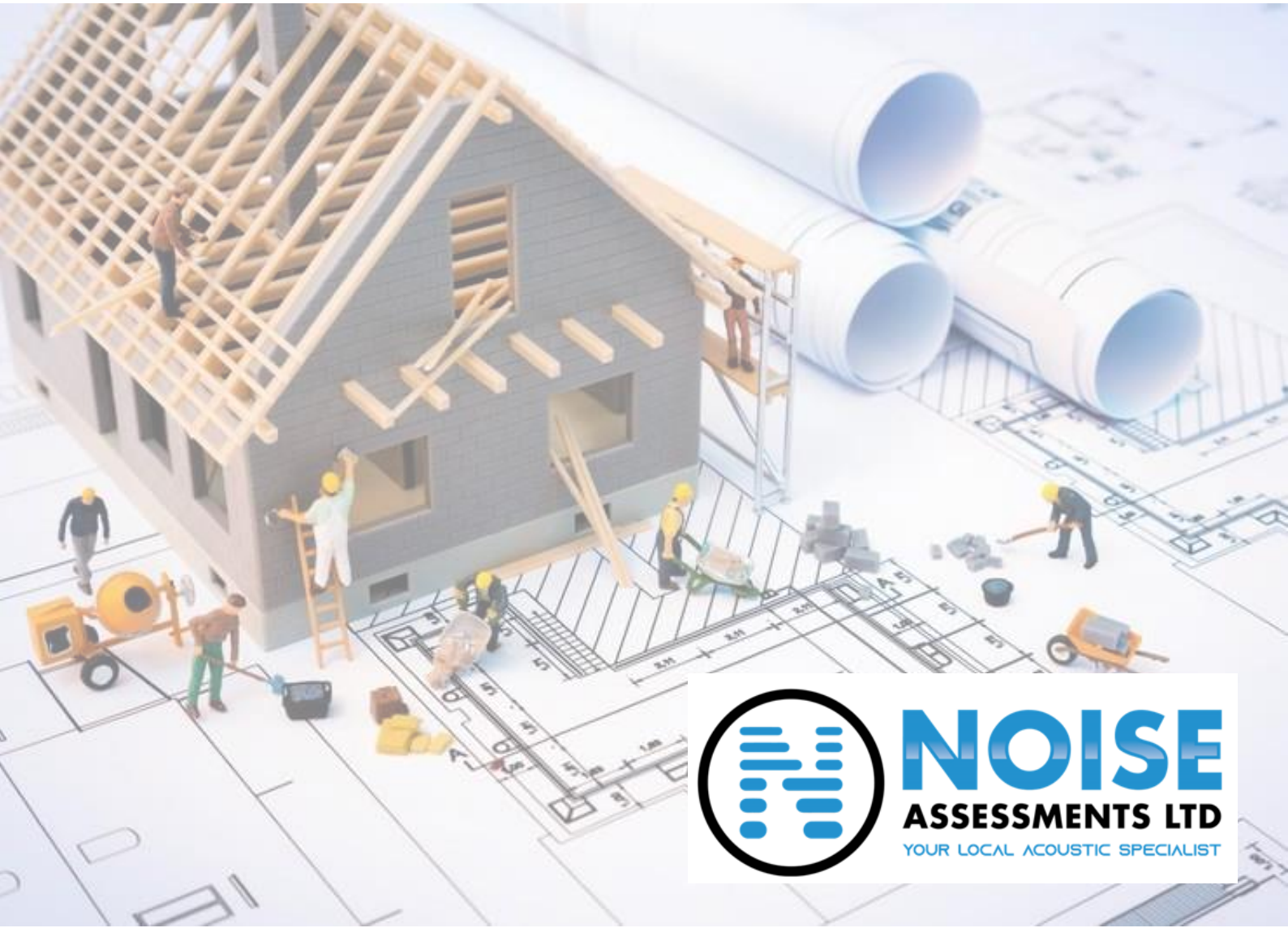
NOISE IMPACT ASSESSMENT

Residential Development

BS 8233:2014



NOISE ASSESSMENTS LTD
YOUR LOCAL ACOUSTIC SPECIALIST

REPORT DETAILS

Report Title	Noise Impact Assessment - Residential Development
Site Address	Chutney Mahal, Folly Hall, Huddersfield, HD1 3PA
Project No.	NALPRO230424.01a
Consultant Contact	jonathan@noiseassessments.co.uk

QUALITY ASSURANCE

Issue No.	Status	Issue Date	Comments	Author	Approved
1	Final	09/05/24	-		
				J Mape BSc (Hons) PgDip TechIOA IOA Cert. Environ. Noise **Noise Consultant**	D Warren **Director**

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Noise Assessments Limited – Companies House Registered No. 12207511

Contents

Assessment Summary

Noise Assessments Ltd was commissioned to assess the potential impact of road noise on up to 32 student bedsits at first, second, third and fourth floors with shared living facilities for a change of use from a former restaurant and to have the ground floor as commercial at Chutney Mahal, Folly Hall, Huddersfield, HD1 3PA.

Planning permission is being sort from Kirklees Council (KC) and a requirement is the completion of a noise assessment to show road noise from the A616 (4m from the façade) does not impact residents in the new dwellings.

Noise impact from the nearby commercial units was also assessed.

The noise from the proposed ground floor commercial units to first floor to adhere to the sound reduction of Rw70dB.

Road Noise at the Façade

The daytime and night-time road traffic noise exposure levels are shown below:

Location	**Daytime dB LAeq (07:00 – 23:00 hrs)**	**Night time dB LAeq (23:00 – 07:00 hrs)**
Development property façade M1	65	65

Peaks of noise from passing vehicles at night was 56 – 70 dB LAmax at Location M1.

No amenity space is proposed for this development.

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

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.

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 40 dB Dne,w+Ctr acoustic trickle ventilation (Titon Xtra Sound Attenuator V75+C60), 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 40 dB Dne,w+Ctr acoustic trickle ventilation (Titon Xtra Sound Attenuator V75+C60), night-time environmental noise in bedrooms would be reduced from 65 dB LAeq,8hr to interior levels 30 dB LAeq,8hr with maximum individual noise events reduced from 70 dB LAFmax to 40 dB LAFmax, therefore within the desirable category.

Outdoor commercial Noise

The potential for noise impact arising from the nearby commercial, however during the monitoring periods, no specific noise (humming, banging etc) was identified. There are no external plant or extraction systems identified which could cause an issue.

Internal Noise Transfer

First floor specifications have been observed and modelled in InsulTM (Marshall Day Acoustics)

The initial model of the current first floor showed a performance of R_w 25 this will be inadequate in attenuating internal noise transfer to within the target criteria therefore one of the following mitigations (minimum additional 45db reduction) is necessary to reduce the noise levels within the receiving room.

- **SoundBlocker Quilt SBQ2** consists of a laminate of 25mm sound absorbing mineral wool, high density acoustic membrane and another layer of 25mm sound absorbing mineral wool. The Quilt exceeds the new Part E Resistance to the Passage of Sound when used in conjunction with other soundproofing materials for separating floors When used as the acoustic infill, SoundBlocker Quilt can improve the sound insulation of a suspended timber floor by up to 13dB.
- **SoundMat 2 Plus** is a tried and tested soundproofing mat designed to reduce unwanted impact and airborne. SoundMat 2 Plus is an exceptionally thin soundproofing solution which is easily installed directly to an existing timber or concrete floor.
- At 12mm the SoundMat 2 Plus offers a slimline solution to help reduce unwanted noise for privacy between floors within your own home. Airborne Performance: 39dB (DnT,w+Ctr) Includes correction for low frequency performance.

By enhancing the first floor, with the following material, the floor will achieve sound reduction of Rw70 dB.

There is also an option to also enhance the ground floor ceiling.

The ceiling construction could consist of the following acoustic material:

- 22mm T &G floorcovering
- Timber joists (circa 150mm deep)
- 100mm Knauf Insulation Earthwool Acoustic Roll
- 40mm of Envirograf Ceiling Barrier up to 65dB rating
- Existing Suspended Ceiling Tiles

This arrangement is predicted to provide an airborne sound insulation performance in the region of 70+ dB Rw.

Therefore, only one of the above mitigation measures are necessary.

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 side 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 to assess the potential impact of road noise on up to 32 student bedsits at first, second, third and fourth floors with shared living facilities for a change of use from a former restaurant at Chutney Mahal, Folly Hall, Huddersfield, HD1 3PA.

1.2 Planning permission is being sort from Kirklees Council (KC) and a requirement is the completion of a noise assessment to show road noise from the A616 (4m from the façade) does not impact residents in the new dwellings.

1.3 Noise impact from the nearby commercial units was also assessed.

1.4 The noise from the proposed ground floor commercial units to first floor to adhere to the sound reduction of Rw70dB.

2. Existing Context

2.1 The site is on an existing disused former restaurant and covers ground to 4th floors.

3. Noise Policy and Guidance

Noise Policy Statement for England (NPSE)

3.1 The NPSE sets out the Government's policy on noise and includes the long-term vision of promoting good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.

3.2 This long-term vision is supported by the following aims:

3.3 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.

3.4 There are two established concepts from toxicology that are currently being applied to noise impacts, for example, by the World Health Organisation. They are:

- 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.

3.5 Extending these concepts further, NPSE leads to the concept of a significant observed adverse effect level:

- SOAEL (Significant Observed Adverse Effect Level) – this is the level above which significant adverse effects on health and quality of life occur.

3.6 NPSE acknowledges that it is not possible to have a single objective noise-based measure that defines NOEL, LOAEL and SOAEL that is applicable to all sources of noise in all situations. It is therefore suggested that more specific advice from other applicable noise standards and guidance could be employed to determine suitable noise level criteria within the overall principles of the NPSE.

National Planning Policy Framework (NPPF)

3.7 The revised NPPF was updated on 5 September 2023 and 19 December 2023 and sets out the government's planning policies for England and how these are expected to be applied. This document replaces the first NPPF published in March 2012 and includes minor clarifications to the revised version published in July 2018, February 2019, July 2021.

3.8 Where issues of noise impact are concerned the NPPF provides brief guidance in Chapter 15 '*Conserving and enhancing the natural environment*' as follows:

Paragraph 170:

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

Paragraph 180:

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 life;

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.

Paragraph 182:

Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed.

Planning Practice Guidance (PPG)

3.9 PPG is written in support of the NPPF and provides an increased level of specific planning guidance.

3.10 It suggests 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 is also suggested that noise should not be considered in isolation and separately from issues such as the economic, social and other environmental dimensions of proposed development.

3.11 Local planning authorities' plan-making and decision taking should take account of the acoustic environment and in doing so consider:

- whether or not a significant adverse effect is occurring or likely to occur;
- whether or not an adverse effect is occurring or likely to occur; and
- whether or not a good standard of amenity can be achieved.

Technical Guidance

ProPG: Planning and Noise

3.12 The Institute of Acoustics (IOA), the Association of Noise Consultants (ANC) and the Chartered Institute of Environmental Health (CIEH) have jointly produced a Professional Practice Guidance (ProPG) document focussing on noise sensitive development. 'ProPG: Planning & Noise' (ProPG)iii describes an approach to encourage good acoustic design in proposed new residential development predominantly exposed to airborne transportation noise. It includes a two-stage design process consisting of an initial noise risk assessment, followed by a systematic consideration of the following key elements:

1. demonstrating a "Good Acoustic Design Process";

2. observing internal "Noise Level Guidelines";
3. undertaking an "External Amenity Area Noise Assessment"; and
4. consideration of "Other Relevant Issues".

3.13 An initial noise risk assessment should be performed to "provide an indication of the likely risk of adverse effects from noise were no subsequent mitigation to be included as part of the development proposal."

3.14 The risk of adverse effect is determined based on the external day and night-time noise levels across the development as shown below in Table 1.

Table 1. ProPG Initial Site Noise Risk Assessment (Taken from Figure 1 of ProPG)

Indicative daytime noise levels $L_{Aeq,16hr}$	Indicative night-time Noise Levels $L_{Aeq,8hr}$	Risk	Potential Effect without mitigation
> 70 dB	> 60 dB	High	
60 – 70 dB	50 – 60 dB	Medium	
50 – 60 dB	40 – 50 dB	Low	Increasing risk of adverse effect
< 50 dB	< 40 dB	Negligible	No Adverse Effect

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. LAeq,16hr is for daytime 0700 – 2300, LAeq,8hr is for night-time 2300 – 0700.
d. An indication that there may be more than 10 noise events at night (2300 – 0700) with LAmax, F > 60 dB means the site should not be regarded as negligible risk.

3.15 Where the level of risk is assessed as greater than 'negligible', a furthermore detailed assessment is required, which includes assessing both internal and external noise levels at the proposed residential properties. Following on from the initial risk assessment, ProPG states that a planning application should demonstrate good acoustic design has been incorporated, according to the following procedures:

1. ''Check the feasibility of relocating or reducing noise levels from relevant sources.
2. Consider options for planning the site or building layout.
3. Consider the orientation of proposed building(s).
4. Select construction types and methods for meeting building performance requirements.
5. Examine the effects of noise control measures on ventilation, fire regulation, health and safety, cost, CDM (construction, design and management) etc.
6. Assess the viability of alternative solutions.
7. Assess external amenity area noise."

3.16 The document provides guidance on internal and external noise levels which should not be exceeded which are very similar to those in BS 8233:2014.

CRTN: Calculation of Road Traffic Noise – 1988

3.17 This document was published by the Department for Transport and the Welsh office in 1988. It sets out the procedures used to calculate noise generated by road traffic. The calculation method is based on various input variables such as traffic speed, road surface and the percentage of heavy's (HGVs) as well as the site geometry and barrier attenuation. The calculation inputs allow for the LA10, 18hour and LA10, 1hour to be calculated at any given receiver.

3.18 The document also provides methods for measuring the noise produced by road traffic stating three different methodologies. The first, "The Measurement Method" is used for direct measurement of the LA10, 18hour. The second, "The Shortened Measurement Procedure" for measurement of the LA10, 3hour noise level from which the LA10, 18hour and LAeq, 16hour level can be derived. The third method Comparative Measurements' is a procedure to ascertain noise levels from a single road traffic route at various points, where the road traffic on that route is the dominant source. CRTN states that if the Shortened Measurement Procedure is followed, a correction of -1dB can be applied to approximate the LA10,18hour noise level a further subtraction -2dB gives and approximation of the LAeq,16hour.

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

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

3.20 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.

3.21 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.

3.22 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 $L_{Aeq,8hour}$

3.23 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.

3.24 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.

3.25 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

3.26 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)

3.27 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.

3.28 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.

3.29 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

3.30 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.

4. Subjective Impressions

4.1 The noise climate on the site is dominated road noise, bird song and dog bark and people chatting.

5. Measurement Location

5.1 Noise monitoring equipment for measuring sound levels was set up to capture daytime and night-time noise on 2nd to 3rd May 2024. The location of the measurement position is shown in Figure 1.

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

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

Figure 1: Site & Measurement Location

Measurement location M1 – Noise Site location

6. Measurement Procedure

6.1 Noise levels were measured on the 2nd to 3rd May 2024. Full measurement times and durations can be found in **Appendix A**.

7. Measurement Equipment

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

7.2 The meter was mounted on a tripod with a microphone height of approximately 1.5 metres above local ground level. The microphone had a windshield fitted at all times, and in excess of 3m from any acoustically reflective surfaces in free-field conditions.

7.3 The calibration level of the meter was checked before and after the survey with a Pulsar N45 sound calibrator with no variation in the levels observed.

7.4 Full calibration details can be provided on request.

8. Weather Conditions

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

9. CRTN: Calculation of Road Traffic Noise Assessment

10. Noise Survey

10.1 A noise survey at monitoring location M1 was conducted on the 2nd to 3rd May 2024.

10.2 The traffic noise survey was carried out at the site from location M1 for representative periods of the daytime and night/early morning. The traffic noise monitoring was carried out for several 15-minute sample periods.

10.3 The measured daytime noise levels have been evaluated in accordance with the 'shortened measurement method' described in the Department of Transport document 'Calculation of Road Traffic Noise' (CRTN), 1988.

10.4 The CRTN shortened measurement method involves taking traffic noise measurements (LA10) over representative sample periods within any three consecutive hours. By using the LA10 (3 hour), as the arithmetic mean of the measured LA10 values, the LA10 (18 hour) value can then be calculated. The LA10 (18 hour) values have then been converted into the equivalent LAeq (16 hour) values using the -2 dB correction that is described in BS 8233:2014.

10.5 The measured night/early morning period LAeq values have been logarithmically averaged to obtain the LAeq (3 hour) night-time value which has been taken as representative of the LAeq(8 hour) night-time value.

10.6 The daytime and night-time road traffic noise exposure levels are shown below (see **Appendix E**).

Location	Daytime dB LAeq (07:00 – 23:00 hrs)	Night time dB LAeq (23:00 – 07:00 hrs)
Development property façade M1	65	65

10.7 Peaks of noise from passing vehicles at night was 56– 70 dB LAmax at Location M1.

10.8 No external amenity area is proposed.

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)	65	50	**32**	**Low Risk of Adverse Effects**	**Desirable** (≤35)
Bedrooms					
Daytime $L_{Aeq,16hr}$ (dB)	65	50	**32**	**Low Risk of Adverse Effects**	**Desirable** (≤35)
Bedrooms					
Night-time $L_{Aeq,8hr}$ (dB)	65	50	**30**	**Low Risk of Adverse Effects**	**Desirable** (≤30)
Night-time $L_{Amax(f)}$ (dB)	70	56	**40**	**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 Daytime Noise Levels in Living Rooms and Bedrooms

11.5 The results demonstrate that, with windows open, internal LAeq and LAmax noise levels during the 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.

11.6 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.

11.7 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.

11.8 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

11.9 Assuming the use of minimum 32 dB Rw+Ctr rated glazing (10/12/6mm) and 40 dB Dne,w+Ctr acoustic trickle ventilation (Titon Xtra Sound Attenuator V75+C60), 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.

11.10 Assuming the use of minimum 32 dB Rw+Ctr rated glazing (10/12/6mm) and 40 dB Dne,w+Ctr acoustic trickle ventilation (Titon Xtra Sound Attenuator V75+C60), night-time environmental noise in bedrooms would be reduced from 65 dB LAeq,8hr to interior levels 30 dB LAeq,8hr with maximum individual noise events reduced from 70 dB LAFmax to 40 dB LAFmax, therefore within the desirable category.

12. Outdoor commercial Noise

12.1 The potential for noise impact arising from the nearby commercial, however during the monitoring periods, no specific noise (humming, banging etc) was identified. There are no external plant or extraction systems identified which could cause an issue.

13. Internal Noise Transfer

13.1 First floor ceiling specifications have been observed and modelled in Insul™ (Marshall Day Acoustics) as shown below.

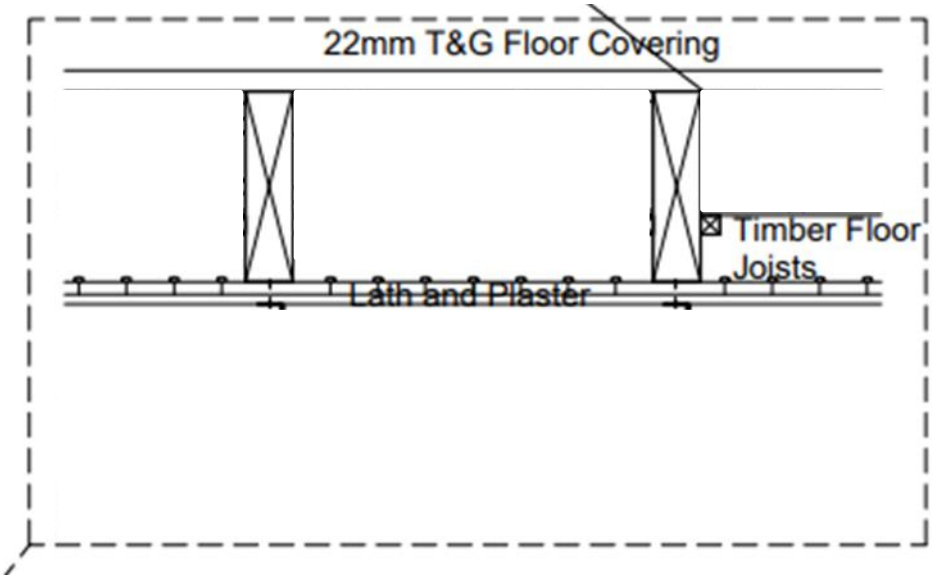
Sound Insulation Prediction (v9.0.5)

Program copyright Marshall Day Acoustics 2017

- Key No. 5547

Job Name:

INSUL



13.2 The initial model of the current first floor showed a performance of R_w 25 this will be inadequate in attenuating internal noise transfer to within the target criteria therefore one of the following mitigations (minimum additional 45db reduction) is necessary to reduce the noise levels within the receiving room.

- **SoundBlocker Quilt SBQ2** consists of a laminate of 25mm sound absorbing mineral wool, high density acoustic membrane and another layer of 25mm sound absorbing mineral wool. The Quilt exceeds the new Part E Resistance to the Passage of Sound when used in conjunction with other soundproofing materials for separating floors When used as the acoustic infill, SoundBlocker Quilt can improve the sound insulation of a suspended timber floor by up to 13dB.
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13.3 By enhancing the first floor, with the following material, the floor will achieve sound reduction of Rw70+ dB.

13.4 There is also an option to also enhance the ground floor ceiling.

13.5 The ceiling construction could consist of the following acoustic material:

- 22mm T &G floorcovering
- Timber joists (circa 150mm deep)
- 100mm Knauf Insulation Earthwool Acoustic Roll
- 40mm of Envirograf Ceiling Barrier up to 65dB rating
- Suspended Ceiling Tiles

13.6 This arrangement is predicted to provide an airborne sound insulation performance in the region of 70+ dB Rw.

13.7 Therefore, only one of the above mitigation measures are necessary.

14. Mitigation

Ceiling

14.1 The existing lath and plaster ceiling between the ground floor and first floor (residents) should be inspected from below to ensure it is intact. All areas of damaged and missing lath and plaster must be made good with a layer of 19mm plank plasterboard and15mm high-density plasterboard.

14.2 Suspended ceiling for the ground floor commercial units could be upgraded using 100mm Knauf Insulation Earthwool Acoustic Roll and 40mm Envirograf Ceiling Barrier.

14.3 No services should puncture this ceiling except for lighting power cables.

15. Summary

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15.4 The noise from the proposed ground floor commercial units to first floor to adhere to the sound reduction of Rw70dB.

Road Noise at the Façade

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15.9 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.

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

15.10 Assuming the use of minimum 32 dB Rw+Ctr rated glazing (10/12/6mm) and 40 dB Dne,w+Ctr acoustic trickle ventilation (Titon Xtra Sound Attenuator V75+C60), 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.

15.11 Assuming the use of minimum 32 dB Rw+Ctr rated glazing (10/12/6mm) and 40 dB Dne,w+Ctr acoustic trickle ventilation (Titon Xtra Sound Attenuator V75+C60), night-time environmental noise in bedrooms would be reduced from 65 dB LAeq,8hr to interior levels 30 dB LAeq,8hr with maximum individual noise events reduced from 70 dB LAFmax to 40 dB LAFmax, therefore within the desirable category

Outdoor commercial Noise

15.12 The potential for noise impact arising from the nearby commercial, however during the monitoring periods, no specific noise (humming, banging etc) was identified. There are no external plant or extraction systems identified which could cause an issue.

Internal Noise Transfer

15.13 First floor specifications have been observed and modelled in InsulTM (Marshall Day Acoustics)

15.14 The initial model of the current first floor showed a performance of R_w 25 this will be inadequate in attenuating internal noise transfer to within the target criteria therefore one of the following mitigations (minimum additional 45db reduction) is necessary to reduce the noise levels within the receiving room.

- **SoundBlocker Quilt SBQ2** consists of a laminate of 25mm sound absorbing mineral wool, high density acoustic membrane and another layer of 25mm sound absorbing mineral wool. The Quilt exceeds the new Part E Resistance to the Passage of Sound when used in conjunction with other soundproofing materials for separating floors When used as the acoustic infill, SoundBlocker Quilt can improve the sound insulation of a suspended timber floor by up to 13dB.
- **SoundMat 2 Plus** is a tried and tested soundproofing mat designed to reduce unwanted impact and airborne. SoundMat 2 Plus is an exceptionally thin soundproofing solution which is easily installed directly to an existing timber or concrete floor.
- At 12mm the SoundMat 2 Plus offers a slimline solution to help reduce unwanted noise for privacy between floors within your own home. Airborne Performance: 39dB (DnT,w+Ctr) Includes correction for low frequency performance.

15.15 By enhancing the first floor, with the following material, the floor will achieve sound reduction of Rw70 dB.

15.16 There is also an option to also enhance the ground floor ceiling.

15.17The ceiling construction could consist of the following acoustic material:

- 22mm T &G floorcovering
- Timber joists (circa 150mm deep)
- 100mm Knauf Insulation Earthwool Acoustic Roll
- 40mm of Envirograf Ceiling Barrier up to 65dB rating
- Suspended Ceiling Tiles

15.18This arrangement is predicted to provide an airborne sound insulation performance in the region of 70+ dB Rw.

15.19Therefore, only one of the above mitigation measures are necessary.

In Summary

15.20A 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 side 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.

15.21The 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	02/05/24	10:00	03/05/24	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	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)
02/05/24	15	2.0	SW	84	0.0	5/8

***Windspeeds measured on site using a Skywatch Xplorer 2 Anemo-Thermometer**

APPENDIX E – 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 side 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

APPENDIX F – Layout Drawing

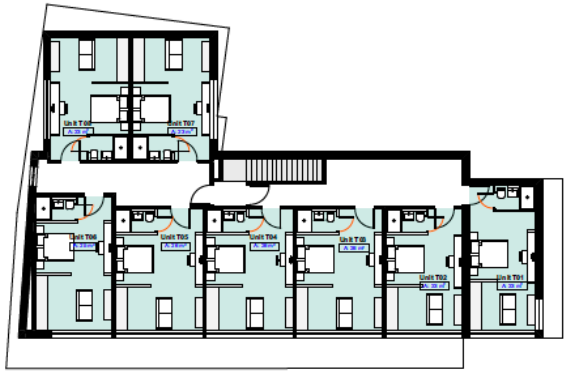

416000
00
50
00
416000
CHAPEL HILL
Engine
Bridge
415950
415950
Factory
FOLLY HALL
El Sub Sta
71.6m
415900
415900
Broomfield
Business Park
Factory
415850
415850
415811
415811
SE1415
SE1415

GROUND FLOOR PLAN

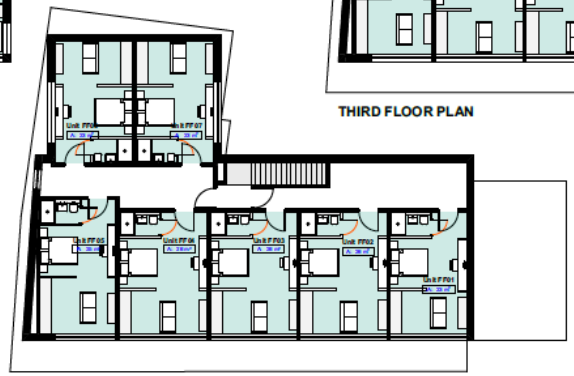
FIRST FLOOR PLAN

SECOND FLOOR PLAN

SCHEDULE OF ACCOMODATION
First Floor x8 Units
Second Floor x9 Units
Third Floor x8 Units
Fourth Floor x7 Units
Total x32 Units



THIRD FLOOR PLAN

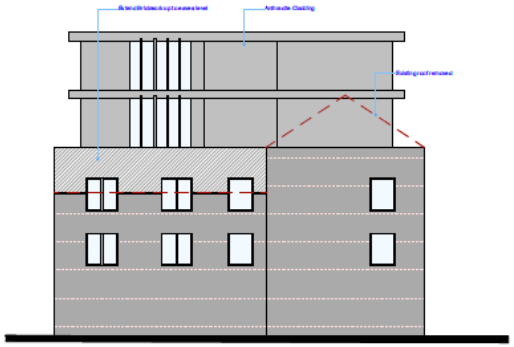


FOURTH FLOOR PLAN

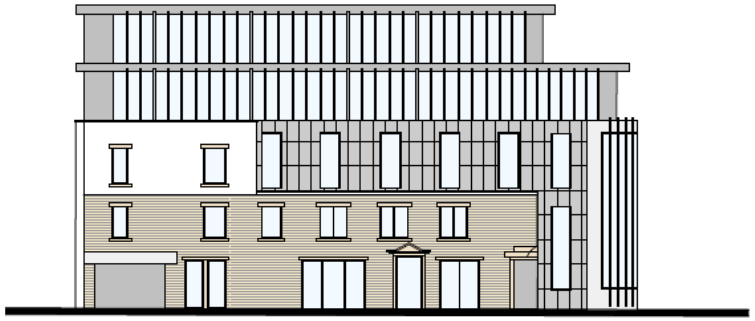
C49 ARCHITECTURE

www.C49-Architecture.co.uk
Info@C49Architecture.co.uk
Tel: 01535 281 432

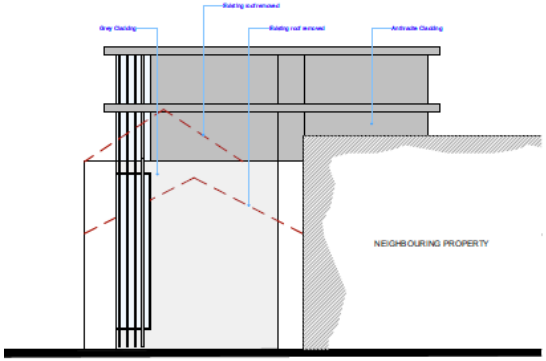
CLIENT DETAILS	DRAWING No	REVISION
FOLLY HALL HUDDERSFIELD	FLH PL 002	
DRAWING INFO Proposed Plans	SCALE 1:100	DATE 22/09/2023
		DRAWN BY JH



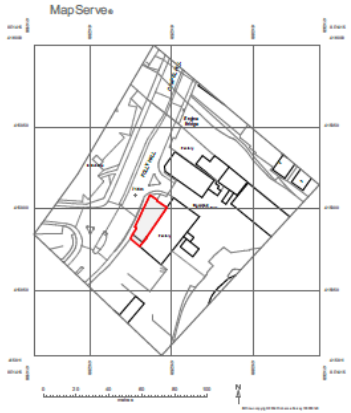
SIDE ELEVATION



FRONT ELEVATION



SIDE ELEVATION



LOCATION PLAN 1:1250

C49 ARCHITECTURE

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CLIENT DETAILS	DRAWING No	REVISION
FOLLY HALL HUDDERSFIELD	FLH PL 003	
DRAWING INFO	**SCALE**	**DATE** / **DRAWN BY**
Proposed Elevations	1:100	22/09/2025 / JH

APPENDIX G –BS8233 Rigorous Design Calculation example

BS8233:2014 Specification Calculation Summary

Bedrooms - Day Time

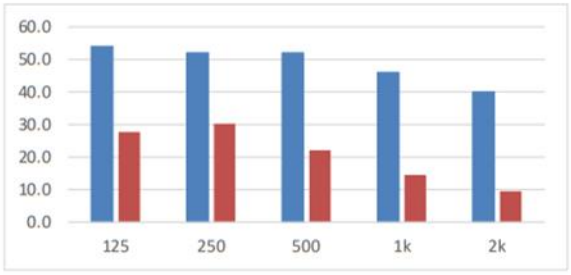
Room Properties

Room Width (m)	4.2
Room Depth (m)	3.0
Room Height (m)	2.4
Glazed Area (m^2)	1.5
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}	24	20	25	34	37
Vents, $D_{n,e,w+Ctr}$	32	25	35	33	32

Noise Levels, dB



External Level	54 dB LAeq
Internal Level	24 dB LAeq
Insertion Loss	30 dB LAeq

Sound Insulation Requirement

	Minimum Sound Insulation Requirement		Suitable Systems
Glazing	**25**	dB R_{W+Ctr}	Double Glazing *4/12/4mm*
Ventilation	**32**	$D_{n,e,w+Ctr}$	Hit & miss trickle vent *Trimvent Select Xtra S13*

Technical Calculations

Frequency, Hz	125	250	500	1k	2k
Term 1	0.000626	0.00314	0.00031	0.0005	0.00063
Term 2	0.000592	0.00149	0.00047	5.9E-05	3E-05
Term 3	6.76E-05	2.7E-05	2.7E-05	3.4E-06	1.3E-06
Term 4	0	0	0	0	0
Internal, dB L_{eq}	27.7	30.2	22.1	14.5	9.4
Internal, dB LAeq	11.6	21.6	18.9	14.5	10.6

Façade Components

Glazing	Double Glazing
Vents	Hit & miss trickle vent

Calculations conducted in accordance with BS8233:2014 rigorous calculation method

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

APPENDIX H – Traffic Survey Data

M1

Daytime (02/05/24)

Start	**End**	**L_{Amax}**	**L_{A10}**	**L_{Aeq}**
16:15	17:15	79.6	68.2	64.6
17:20	18:20	76.7	67.6	64.0
18:25	19:25	79.9	67.3	65.0

LA10 (3 hr) = 68 dB

LA10 (18 hr) = LA10 (3 hr) -1 = 67 dB

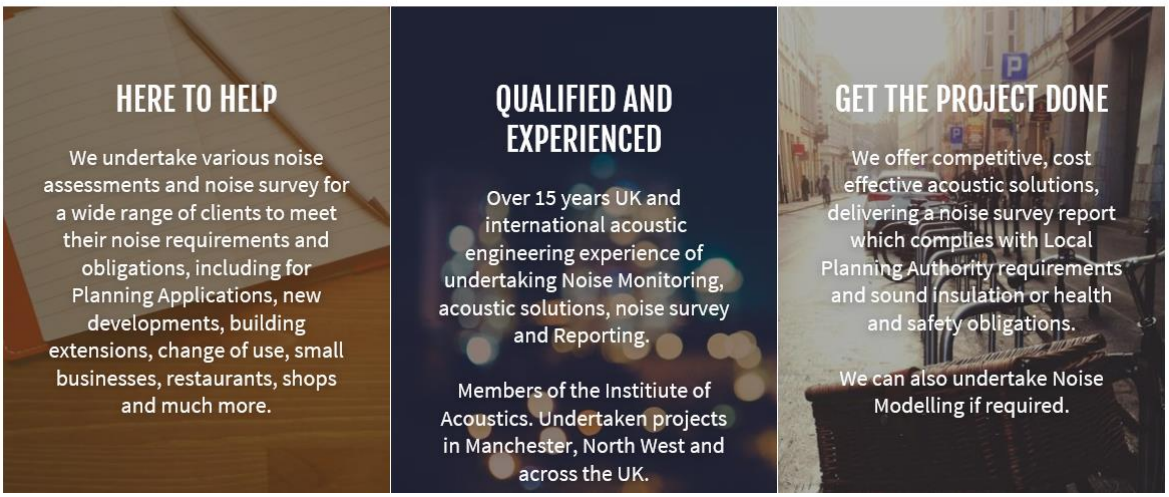
LAeq (16 hr) = LA10 (18 hr) -2 = 65 dB

Night/Early Morning (03/05/24)

Start	**End**	**L_{Amax}**	**L_{A10}**	**L_{Aeq}**
03:50	04:50	55.5	47.5	45.4
04:55	05:55	58.3	53.5	49.7
06:00	07:00	70.2	69.4	65.3

Log Average LAeq = 65 dB LAeq(3 hr)

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.