



Residential Noise Assessment

Site Address: 29 Station Road, Port Talbot, SA13 1NN

Client Name: Mehmet Dilki

Project Reference No: NP-012392



Authorisation and Version Control

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1. Introduction

NOVA Acoustics Ltd has been commissioned to prepare a noise impact assessment for a residential development ('the proposed development') at 29 Station Road, Port Talbot, SA13 1NN ('the site'). The proposed development is for the creation of 3no. flats on the first, second and third floors of the property and construction of a rear dormer.

The applicant has received conditional approval for planning application No. P2024/0442 ('the application') from the Local Planning Authority ('LPA'), Neath Port Talbot County Borough Council. This report has been prepared to discharge Condition 3 imposed on the proposed development.

A noise survey has been undertaken to establish the prevailing sound levels at the proposed development. The findings have been subsequently used to assess the suitability of the site for residential use. Additionally, measurements of the existing fixed mechanical plant associated with the ground floor commercial use have also been undertaken. Measures required to mitigate noise impacts for the proposed development have been assessed in accordance with the relevant performance standards, legislation, policy, and guidance.

This noise assessment is necessarily technical in nature; therefore, a glossary of terms is included in Appendix A to assist the reader.

1.1 Standards, Legislation, Policy & Guidance

The following performance standards, legislation, policy, and guidance have been considered to ensure good acoustic design in the assessment:

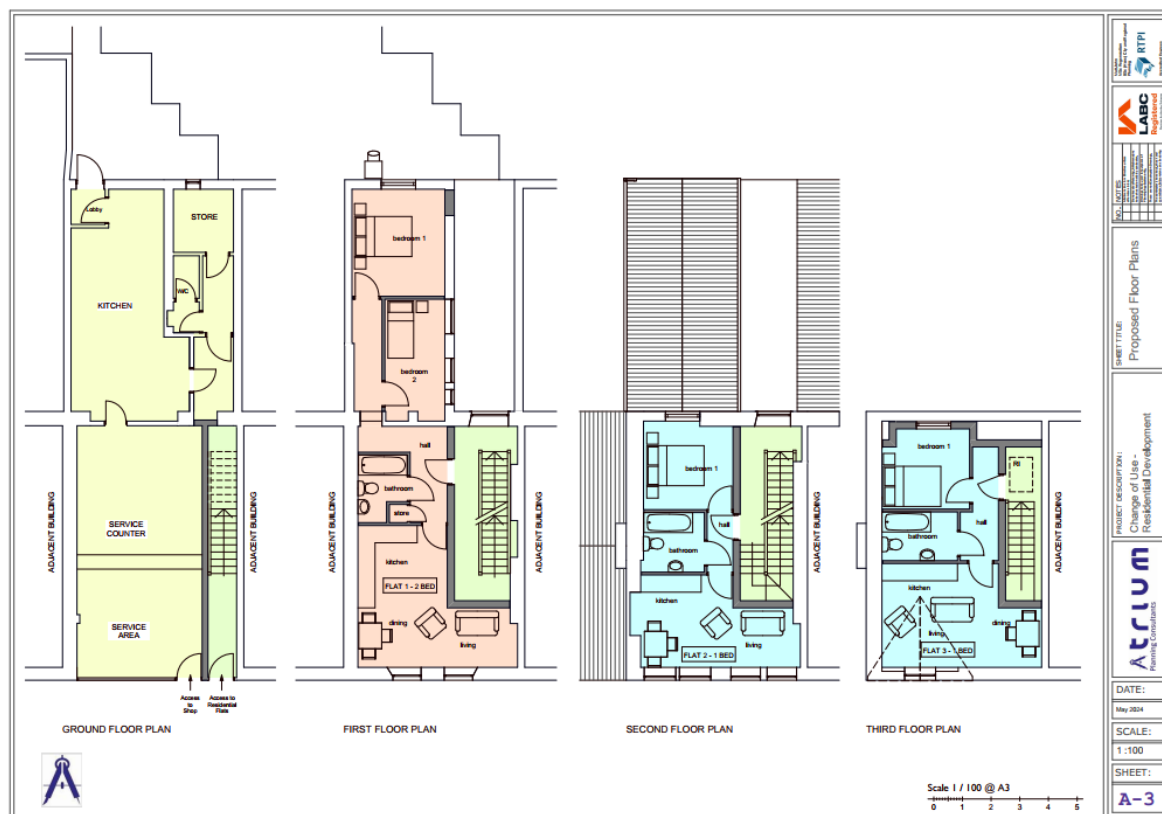
- Planning Policy Wales PPW (2021)
- Technical Advice Note (Wales) (TAN9) – Enforcement of Planning Control
- Technical Advice Note (Wales) (TAN11) – Air Quality, Noise and Soundscape
- British Standard BS8233:2014 – 'Guidance on sound insulation and noise reduction for buildings'.
- Approved Document F: Volume 1 Dwellings (2021).
- Acoustics Ventilation Overheating: Residential Design Guide 2020' (AVO Guide).
- Entertainment Noise Legislation.

Further information on the legislation can be found in Appendix B.

1.2 Proposal Brief

The proposal is for the material change of use of the upper floors to create 3no. flats on the first, second and third floor of the development. Each flat shall occupy the entirety of the floor, with the proposed bedrooms situated to the rear of the development and the living area to the front. The flats shall have their own access immediately adjacent to the access for the ground floor commercial premises which is to be retained.

The figure overleaf shows the general arrangement plans for the proposed development.



Drawing Ref. Proposed Floor Plans from 'Atrium Planning Consultants'

Figure 1 – Proposed Development – General Arrangement Plan

1.3 Local Planning Authority & Background

The following pre-commencement condition of the approved planning application no. P2024/0442 requires discharging:

“Condition 3:

The development authorised by this permission shall not begin until the Local Planning Authority has approved in writing a full Noise Assessment to design suitable noise insulation to the flats considering the existing ground floor commercial uses within the area and noise from ducting and mechanical plant from the commercial units and its potential impact upon the occupiers of the hereby approved flats. The submitted scheme shall fully detail all necessary alterations and amendments that would be necessary to ensure that the residential amenity of the flats is not adversely impacted through noise. The approved scheme shall be fully implemented on site prior to the first beneficial use of any of the approved flats and shall be retained as such thereafter.

Reason:

To ensure that noise from the ground floor commercial use do not adversely impact the residential amenity of the future occupiers of the flats, and in accordance with Policy EN8 of the Neath Port Talbot Local Development Plan.”

2. Environmental Noise Survey

2.1 Measurement Methodology

The following table outlines the measurement dates and particulars. All equipment was fitted with its proprietary environmental kit, including a 130mm windshield. Field calibrations were performed before and after each set of measurements; negligible drift was noted. The equipment registers and meteorological conditions during the survey are available in Appendix D.

All measurements were undertaken under façade conditions. These have been corrected by -3dB to convert them to a free-field level.

Location	Survey Dates	Measurement Particulars
MP1	21 – 24/03/2025	Microphone protruding out of a top floor window on the front façade. Measurement position has a clear line of sight to Station Road below.
MP2	21 – 24/03/2025	Microphone protruding out of a top floor window on the rear façade. Measurement position overlooks Heilbronn Way and the external fixed plant associated with the commercial premises below.

Table 1 – Measurement Methodology

In addition to the long-term measurements, short-term attended spot measurements were performed of the fixed plant serving the ground floor commercial premises located within the same building.

The figure below outlines the site surroundings and measurement locations:



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Figure 2 – Measurement Locations and Site Surroundings

2.2 Context & Subjective Impression

The proposed development site is located within the main town centre of Port Talbot, off Station Road. The surrounding premises are predominantly commercial in nature, including multiple restaurants, takeaways, bars, and general commercial typical for town centre street scene. Approximately 35m southwest of the site is the A48 dual carriageway. Further to the southwest is the Port Talbot Parkway Railway Station, approximately 70m from the rear of the proposed development.

The table below details the nearest commercial premises and their operating times. Note that any businesses viewed to be lower risk have been omitted.

Premises and Location	Business Type	Opening Hours
B2M, 39 Station Road	Nightclub and Bar	- Operating hours unknown and cannot be determined through data analysis.
Jimmy's Bar, 33 Station Road	Nightclub and Bar	- Thursday and Sunday: 22:00 – 02:00 hours - Friday to Saturday: 22:00 – 04:00 hours
Pizza Pizza and Waffle Town, 29 Station Road (Within the Development)	Takeaway Restaurant	- Sunday to Thursday: 16:00 – 23:00 hours - Friday to Saturday: 16:00 – 01:00 hours (Weekend hours based on discussion with the client)
Bollywood Lounge, 27 Station Road	Restaurant	- Monday to Sunday: 17:00 – 22:00 hours
Casa Pizza, 25 Station Road	Restaurant	- Sunday to Friday: 17:00 – 22:30 hours - Saturday: 16:00 – 23:00 hours
Pizza Factory, 8 Station Road	Restaurant	- Monday: 16:30 – 22:30 hours - Tuesday to Thursday: 16:00 – 22:30 hours - Friday to Saturday: 16:30 – 00:00 hours - Sunday: 12:00 – 22:30 hours
Istanbul Kebab House, 12 Station Road	Takeaway	- Sunday to Thursday: 16:00 – 00:00 hours - Friday to Saturday: 16:00 – 01:00 hours
Murphy's Main Stage, 18 Station Road	Bar	- Monday: Closed - Tuesday to Wednesday: 18:00 – 23:00 hours - Thursday: 18:00 – 00:00 hours - Friday to Saturday: 18:00 – 02:00 hours - Sunday: 18:00 – 00:00 hours

Table 2 – Sound Level Results Summary

During the site visits, the majority of the surrounding restaurants and businesses were closed, thus a subjective impression of the noise emissions associated with these businesses could not be determined. However, fixed plant serving these premises were identified. The kitchen extract serving the associated business was noted to have a high pitched tone, but was not dominant over road traffic noise.

The acoustic environment is moderate in level, with tyre roar from the A48 identified as being the dominant noise source to both the front and rear façades. Although the front façade benefits from being shielded by the surrounding buildings from the A48, road noise from the dual carriageway was still noted to be dominant during the site visits – albeit at a lower level. Secondary sources include localised slow-moving vehicles on Station Road and intermittent train movements on the nearby railway line.

2.3 Environmental Noise Survey Results

The following section outlines the measured sound levels during the survey. The time history results can be found in Appendix D. Given the presence of entertainment premises within the area, including bars and nightclubs, the worst-case 15-minute period has also been reported.

Location	Measurement Period ('T')	Octave Frequency Band (Hz, $L_{eq,T}$, dB)							$L_{Aeq,T}$ (dB)	'Typical' $L_{AFmax,1min}$ (dB)
		63	125	250	500	1k	2k	4k		
MP1	$L_{eq,16hr}$ (Day)	64	58	54	54	54	50	42	58	--
	$L_{eq,8hr}$ (Night)	61	57	60	55	53	49	44	58	82
	Highest $L_{eq,1hr}$ (Day)	65	57	54	58	56	51	44	60	--
	Highest $L_{eq,1hr}$ (Night)	66	61	55	59	57	52	45	61	--
MP2	$L_{eq,16hr}$ (Day)	58	54	54	52	53	49	40	56	--
	$L_{eq,8hr}$ (Night)	59	52	52	50	49	45	37	53	70
	Highest $L_{eq,1hr}$ (Day)	60	57	56	56	57	55	45	61	--
	Highest $L_{eq,1hr}$ (Night)	63	60	60	58	54	50	43	60	--

Table 3 – Sound Level Results Summary – Environmental Survey

Measurements were also undertaken on 21/04/2025 of the kitchen extract serving the ground floor unit. A summary of the measured sound levels taken of the external kitchen extract outside the proposed bedroom window on the first floor are presented below.

Description	Duration ('mm:ss')	Octave Frequency Band (Hz, $L_{eq,T}$, dB)							$L_{Aeq,T}$ (dB)
		63	125	250	500	1k	2k	4k	
Kitchen Extract Operating (1m from unit)	06:40	63	57	54	52	54	51	44	58
Residual Measurement	05:24	65	55	53	53	54	52	45	58

Table 4 – Sound Level Results Summary – Kitchen Extract Measurements

3. Agent of Change Principle

As the dominant noise sources affecting the proposed residential development are related to commercial businesses, the 'Agent of Change' principle must be considered. Regarding this, the following is stated in Paragraph 200 of the NPPF:

"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."

As noted in the previous section, there are multiple businesses in the immediate surrounding area that operate into the night-time period, including entertainment premises. Additionally, there is also an associated takeaway restaurant on the ground floor with plant terminating close to the proposed bedroom windows. It should be noted that an element of commercial noise is likely to be acceptable considering that anyone moving into the area will be aware of the commercial nature of the area; however, they may not realise the extent of the noise emissions associated with the businesses given that the majority of them do not open until the late afternoon and into the night. Therefore, consideration must be given to the potential risk of complaints to ensure that undue restrictions are not placed on the surrounding commercial premises that could limit their current or future use.

4. Noise Break-in Assessment and Sound Insulation Scheme

4.1 Internal Noise Level Criteria

Analysis of the low frequency time history graph, available in Appendix D, indicates that entertainment noise is present within the area; particularly on the front façade. As this is more characterful than steady state noise sources such as transport, the Moorhouse Curve criteria has been adopted as presented in the table below.

Location	Day & Night
All Rooms	63Hz limit of 47dB 125Hz limit of 41dB

Table 5 – Low Frequency Acoustic Design Criteria (Moorhouse)

As previously stated, the rear of the site is affected by noise from the item of plant serving the ground floor unit. Whilst the loudest 1-hour ambient sound levels are more onerous, typically, an assessment of plant noise would still be carried out and assessed in accordance with BS4142. However, as assessment of indoor noise impacts from plant noise is outside of the scope of BS4142, consideration of BS8233 criteria must be applied.

The internal ambient noise level guidelines stated within BS8233 are determined as relating to 'steady external noise sources'. This is typically considered as relating to transportation noise sources. Plant noise would be considered as falling outside of this scope and in such instances, BS8233 states the following:

"NOTE Noise has a specific character if it contains features such as a distinguishable, discrete and continuous tone, is irregular enough to attract attention, or has strong low-frequency content, in which case lower noise limits might be appropriate."

Therefore, it is proposed that plant noise is controlled to 5dB below the internal noise level criteria within BS8233 as a minimum.

In addition to meeting the Moorhouse criteria in Table 5, it is also proposed that this reduction of 5dB is also applied in relation to commercial and entertainment noise in the area. Finally, the loudest 1-hour measurements will be used to inform the noise break-in assessment.

By adopting these criteria, it is thought that the future occupants will be adequately protected against any adverse impacts from the surrounding businesses, plant and infrastructure network. This is deemed an extremely robust approach.

A summary of the proposed criteria for the development is provided below.

Activity	Location	Daytime (07:00 – 23:00)	Night-time (23:00 – 07:00)
Resting	Living Room	30dB $L_{Aeq,16hr}$ / NR25 + Moorhouse	--
Dining	Dining Room/Area	35dB $L_{Aeq,16hr}$ / NR30 + Moorhouse	--
Sleeping (daytime resting)	Bedroom	30dB $L_{Aeq,16hr}$ / NR25 + Moorhouse	25dB $L_{Aeq,8hr}$ / NR20 + Moorhouse 45dB L_{AFmax} *

*Note 1: The maximum criteria have been taken from the World Health Organisation (WHO) Guidelines for Community Noise.

*Note 2: ProPG:2017 which is relevant to 'New Residential' states; "In most circumstances in noise sensitive rooms at night (e.g., bedrooms) good acoustic design can be used so that individual noise events do not normally exceed 45dB $L_{Amax, F}$ more than 10 times a night. However, where it is not reasonably practicable to achieve this guideline then the judgement of acceptability will depend not only on the maximum noise levels but also on factors such as the source, number, distribution, predictability, and regularity of noise events".

Note 3: BS8233 states: "Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved".

Note 4: BS8233 states: "The levels shown in Table 4 (criteria shown above) are based on the existing guidelines issued by the WHO and assume normal diurnal fluctuations in external noise. In cases where local conditions do not follow a typical diurnal pattern, for example on a road serving a port with high levels of traffic at certain times of the night, an appropriate alternative period, e.g., 1 hour, may be used, but the level should be selected to ensure consistency with the levels recommended in Table 4.

Note 5: BS8233 states: "If relying on closed windows to meet the guide values, there needs to be an appropriate alternative ventilation that does not compromise the façade insulation or the resulting noise level.

Table 6 – Internal Acoustic Design Criteria

4.2 Glazing and Background Ventilation Specification

The following section provides a glazing and background ventilation specification that achieves the relevant internal noise criteria. The calculations considering the following sound insulation scheme can be found in Appendix E.

On site observations indicate that single glazing is present on the upper floors. Although good acoustic design has been implemented by locating the living rooms on the noisier front façade, due to the late operating hours of many surrounding businesses and presence of entertainment noise in the area, upgrades to the existing glazing will be required.

Description	Octave Frequency Band (Hz, dB)							Overall (dB)
	63	125	250	500	1k	2k	4k	
Sound Insulation Scheme – Front Living Rooms & Bedrooms								
6mm Optiphon Glass / 16mm Argon Cavity / 6.8mm Optiphon Glass (SRI)*	21	21	28	37	48	48	54	40 R _w (-6; C _{tr})
Titon V50 + Standard Canopy (2 No. Trickle) (D _{ne})*	--	34	37	35	36	41	42	38 D _{ne,W} (-2; C _{tr})
Sound Insulation Scheme – Rear Living Rooms & Bedrooms								
6mm Optiphon Glass / 16mm Argon Cavity / 6.8mm Optiphon Glass (SRI)*	21	21	28	37	48	48	54	40 R _w (-6; C _{tr})
Notes: <i>*Any other window or ventilation specification capable of providing this attenuation will be suitable provided the glazing suppliers can provide an acoustic test report in accordance with BS EN ISO 10140-2:2010 or an evidence-based calculation.</i> <i>Please note that the performance specified for the trickle vents must be achieved with them in the ‘open’ position.</i>								

Table 7 – Glazing & Background Ventilation Specification

Due to the influence of plant noise to the rear of the site, the same glazing specification has been made to the rear as the front.

As identified above, no trickle vents are specified on the rear façade due to this same reason. In such instances, it is advised that a mechanical ventilation is instead installed in order provide appropriate forms of whole dwelling (background) ventilation.

5. Overheating Screening Assessment

To avoid excessively high temperatures and provide adequate levels of thermal comfort within dwellings, an overheating mitigation strategy must be developed. In low noise areas, this strategy can often rely upon opening windows as the primary source of ventilation, however, in areas with higher levels of noise, this would present a risk of adverse effects on health and quality of life.

5.1 Overheating Criteria

Considering that the development is a change of use and not new build, it is not a requirement to achieve the criteria defined in Approved Document O ('ADO'). However, to allow for a reasonable living environment, it is recommended that the less onerous criteria given in the 'Acoustics Ventilation and Overheating Design Guide' ('AVO') should be applied. Considering that a partially open window provides approximately 13 dB of attenuation (as stated in 'AVO') the proposed internal and external noise criteria are summarised below.

Note that due to the presence of plant and entertainment noise, the overall ambient sound levels from the loudest hour have been used.

Period	Proposed Criteria (dB)		External Level (dB)	
	Internal	External	Measured	Exceedance
Front Façade (worst-case hour)				
Daytime ($L_{Aeq,16hr}$)	50 [1]	63	60	-3
Night-time ($L_{Aeq,8hr}$)	42 [1]	55	61	+6
Night-time ($L_{AFmax,T}$) [2]	65 [1]	78	82	+4
Rear Façade (worst-case hour)				
Daytime ($L_{Aeq,16hr}$)	50 [1]	63	61	-2
Night-time ($L_{Aeq,8hr}$)	42 [1]	55	60	+5
Night-time ($L_{AFmax,T}$) [2]	65 [1]	78	70	-8
Notes: [1] Criterion taken from the AVO guide. Above this level, it is stated: "Noise causes a material change in behaviour, e.g., having to keep windows closed most of the time." [2] L_{AFmax} exceeded fewer than 10 times per night.				

Table 8 – External Noise Level Limits for Overheating Criteria

5.2 Overheating Assessment

The noise levels measured on site exceed the external night-time noise criteria shown in the table above. As there are only daytime rooms on the front façade, however, this may be acceptable. In relation to the rear façade, an assessment of whether the development is at risk of overheating would need to be undertaken by a suitably qualified person. Should the outcome indicate the site is at low risk of

overheating, then a secondary ventilation strategy may not be required. If the outcome is that the site is at moderate to high risk, then it is recommended that openable windows are not used as the primary source of ventilation.

Furthermore, the agent of change principle must be considered. By not relying on open windows to ventilate the building reduces the risk of complaints from future occupants, further protecting the surrounding businesses.

Alternative forms of ventilation include passive systems (such as acoustic louvres) and mechanical systems (such as 'centralised mechanical extract ventilation' and 'mechanical ventilation with heat recovery'). The installation of passive systems is generally preferable; however, the precise requirements must be confirmed with a ventilation specialist. Further to this, it must also be ensured that all ventilation strategies are compliant with the requirements of Approved Document F.

It should be noted that this assessment relates exclusively to overheating mitigation, and as such, open windows may be used for purge ventilation without acoustic constraint.

Further advice can be provided by NOVA Acoustics if required.

6. Noise Breakthrough Assessment and Sound Insulation Scheme

6.1 Noise Breakthrough Criteria

The proposed development structurally adjoins a commercial property via a separating floor. BS8233:2014 states that the internal noise criteria includes 'overall noise' which is the sum of structure borne and airborne noise sources. Noise breaking through from structurally adjoining commercial property will be considered to ensure the total noise from both structurally adjoining commercial properties and external noise ingress, does not exceed the proposed acoustic design criteria. Guidance on sound insulation between adjoining domestic and non-domestic dwellings is discussed in Approved Document E (ADE) of the Building Regulations, section 0.8 of Part E states.

"The performance standards set out in Tables 1a and 1b are appropriate for walls, floors and stairs that separate spaces used for normal domestic purposes. A higher standard of sound insulation may be required between spaces used for normal domestic purposes and communal or non-domestic purposes. In these situations, the appropriate level of sound insulation will depend on the noise generated in the communal or non-domestic space. Specialist advice may be needed to establish if a higher standard of sound insulation is required and, if so, to determine the appropriate level."

The higher standard of sound insulation required is dependent on the level of noise generated within the commercial property. Noise from structurally adjoining commercial sources can lead to elevated impact and as such further consideration is given to the level of audibility, dominance, attention grabbing features, spectral distribution, regularity, change in level, duration, and time of day the sound is occurring. The commercial properties 'Use Classes' can assist in defining a suitable higher standard of sound insulation.

6.2 Noise Breakthrough Assessment and Specification

The following table outlines the expected level of risk associated with the 'Class Use' of the structurally adjoining commercial property and provides a required sound insulation standard including a discussion to justify the standard. Although the business below only offers takeaway services, Class Use E(b) is viewed to be the most appropriate.

Planning Class	Level of Risk from Noise	Required Sound Insulation Standard (dB)
E(b) Sale of food and drink for consumption (mostly) on the premises	High	$\geq 65 D_{nT,w} + C_{tr}$
Discussion: The noise emissions produced by food and drink premises includes both amplified music, noise from patrons and noise from kitchen / food preparation areas. Amplified music associated with primarily dining premises is normally of a background level to facilitate conversation and as such is not a primary concern. The noise from patrons can vary significantly and is highly dependent on the nature of the establishment. The required level of sound insulation should consider raised and elevated vocal efforts occurring regularly. The permitted opening hours extend into the night-time period (23:00 – 07:00) and as such the sensitivity of the adjoining residential requires additional consideration during this period.		

Table 9 – Noise Breakthrough Assessment

6.3 Existing Sound Insulation Performance

Sound insulation tests were performed on the existing separating floor between the existing ground floor commercial premises and the first floor above. Observations made by the site engineer indicate that the floor build-up currently comprises of a lath and plaster ceiling, approximately 200mm timber joists and old pine floorboards. There was also a decorative timber structure on the underside, of which the exact make up is unknown.

The results below are indicative of the sound insulation performance of the separating partition between the ground and first floor areas. Sound insulation testing certificates can be found in Appendix F.

Test No.	Source Room	Receiving Room	Measured Level (dB)	Required Level (dB)	Criteria Achieved (Y/N)
01	GF Commercial Unit	1F Bedroom	49 $D_{nT,w} + C_{tr}$	≥ 65 $D_{nT,w} + C_{tr}$	N

Table 10 – Sound Insulation Testing Results

Whilst the performance achieves the minimum performance requirements of Approved Document E of the building regulations, further upgrades are required to meet the performance specification in Table 9. As such, improvements are required to comply with the adopted criterion outlined in section 6.2.

6.4 Proposed Sound Insulation Specification - Floor

An indicative specification that can achieve the required sound insulation standard is outlined below. The airborne sound reduction provided by the proposed system has been modelled in INSUL 9.0 and is predicted to achieve high levels of sound insulation.

The below specification outlines installing an independent ceiling to the commercial space below. This would require the following construction:

- Existing timber floorboards made good
- Existing 200mm Timber Joists with 100mm Rockwool RW45 (45kg/m³) tightly and evenly fitted.
- Existing lath and plaster ceiling to be retained and made good.
- New independent timber joists fixed to the external walls with joist hangers. There should be no rigid connections between the new joists and existing lath and plaster layer, creating a fully isolated system.
- Rubber isolation clips and furring channels affixed to the underside of the new joists, with min. 50mm Rockwool RW45 (45kg/m³) installed within the cavity.
- 2no. 12.5mm SoundBloc Plasterboards, with boards tightly abutted and joints staggered. The outer layer should have all joints taped and sealed, and have flexible sealant applied around the perimeter where the boards meet the external/internal walls.

It should be noted that this report provides an indicative specification that can achieve the required acoustic performance and considers that all flanking routes for sound have been appropriately suppressed. As with any construction project, the ability to meet the specification will rely upon the quality of the built structure. As such the works should be carried out to a high standard of workmanship to ensure that any sound insulation measures are not breached, for example by installing a rigid connection

across an isolated connection. The development cannot achieve compliance until sound insulation testing is carried out by a UKAS accredited sound insulation testing company upon completion and assessed against the required sound insulation standard.

7. Conclusion and Action Plan

The proposed development has been assessed against the acoustic design criteria and a sound insulation scheme has been provided to ensure the requirements of Condition 3 are met.

The following 'Action Plan' is outlined to ensure the design considerations and specifications from this report are duly implemented:

1. The proposed glazing and background ventilation system, or a suitable alternative, should be installed as shown in section 4.1.
2. To protect the surrounding businesses and prevent elevated internal sound levels when mitigating overheating, it is strongly advised that the proposed development is not ventilated by open windows and adopts an alternative ventilation strategy. This is discussed in section 5.2 and considers the agent of change principle.
3. The separating floor between the structurally adjoining commercial property and the proposed development should be designed to achieve the required sound insulation. An indicative specification has been provided in section 5.0. Further design assistance can be provided by NOVA Acoustics Ltd if required.

The findings of this report will require written approval from the Local Authority prior to work commencing.

Appendix A – Acoustic Terminology

A-weighted sound pressure level, L_{pA}	Quantity of A-weighted sound pressure given by the following formula in decibels (dBA). $L_{pA} = 10 \log_{10} (pA/p_0)^2$. Where: pA is the A-weighted sound pressure in pascals (Pa) and p_0 is the reference sound pressure (20 μ Pa)
Background Sound	Underlying level of sound over a period, T , which might in part be an indication of relative quietness at a given location
Equivalent continuous A-weighted sound pressure level, $L_{Aeq,T}$	Value of the A-weighted sound pressure level in decibels (dB) of a continuous, steady sound that, within a specified time interval, T , has the same mean-squared sound pressure as the sound under consideration that varies with time
Facade level	Sound pressure level 1 m in front of the facade
Free-field level	Sound pressure level away from reflecting surfaces
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
Noise Criteria	Numerical indices used to define design goals in a given space
Noise Rating (NR)	Graphical method for rating a noise by comparing the noise spectrum with a family of noise rating curves
Octave Band	Band of frequencies in which the upper limit of the band is twice the frequency of the lower limit
Percentile Level, $L_{AN,T}$	A-weighted sound pressure level obtained using time-weighting “F”, which is exceeded for $N\%$ of a specified time interval
Rating Level, $L_{Ar,Tr}$	Equivalent continuous A-weighted sound pressure level of the noise, plus any adjustment for the characteristic features of the noise
Reverberation time, T	Time that would be required for the sound pressure level to decrease by 60 dB after the sound source has stopped
Sound Pressure, p	root-mean-square value of the variation in air pressure, measured in pascals (Pa) above and below atmospheric pressure, caused by the sound
Sound Pressure Level, L_p	Quantity of sound pressure, in decibels (dB), given by the formula: $L_p = 10 \log_{10}(p/p_0)^2$. Where: p is the root-mean-square sound pressure in pascals (Pa) and p_0 is the reference sound pressure (20 μ Pa)
Weighted sound reduction index, R_w	Single-number quantity which characterizes the airborne sound insulating properties of a material or building element over a range of frequencies

Appendix B – Standards, Legislation, Policy, and Guidance

This report is to be primarily based on the following standards, legislation, policy, and guidance.

B.1 – Planning Policy Wales (2024)

Government policy on noise is set out in the Planning Policy Wales (PPW), published in 2021. This replaced all earlier guidance on noise and places an emphasis on sustainability. In section 2, paragraph 2.26 states:

“Planning authorities should ensure that social, economic, environmental and cultural benefits are considered in the decision-making process and assessed in accordance with the five ways of working to ensure a balanced assessment is carried out to implement the Well-being of Future Generations Act and the Sustainable Development Principle. There may be occasions when one benefit of a development proposal or site allocation outweighs others, and in such cases robust evidence should be presented to support these decisions, whilst seeking to maximise contributions against all the well-being goals.”

Paragraph 3.24 states:

“Where significant effects on human health are likely to arise as a result of development plans or individual development proposals, environmental impacts should be considered in full knowledge of the likely consequences for health. Information to assess potential impacts on health can be required through various mechanisms, such as sustainability appraisal of development plans and environmental impact assessments, and where relevant, health impacts should be incorporated into such assessments. In general, the most effective and collaborative ways of working will require shared and integrated approaches to evidence gathering and assessments. Health Impact Assessment¹³ makes a valuable contribution towards plan making. It may be useful when proposing or making decisions on new development along with evidence collected by Public Service Boards. Evidence on health impacts can help the planning system develop stronger and more coherent approaches towards maximising health and well-being.”

B.2 – Technical Advice Note (Wales) 9 (1997) – Enforcement of Planning Control

Paragraph 1 of TAN9 states:

“1. This Technical Advice Note (Wales) (TAN) should be read in conjunction with 'Planning Guidance (Wales): Planning Policy'. Planning Guidance, Technical Advice Notes and circulars should be taken into account by local planning authorities in Wales in the preparation of development plans. They may be material to decisions on individual planning applications and will be taken into account by the Secretary of State and his Inspectors in the determination of appeals and called-in planning applications.”

B.3 – Technical Advice Note (Wales) 11 (2022) – Air Quality, Noise and Soundscape

Section 1 of TAN11 states:

“This TAN provides further policy guidance and technical advice to support planning policy in PPW relating to air quality, noise and soundscape. The policy framework in PPW requires proactive and preventative action which achieves better health outcomes, reduces health and social inequalities and does more than think about not breaching thresholds, driving down decibels and using up 'headroom'. A better quality

strategic outcome or individual development proposal will not cause exposure to airborne pollution, or at the very least should minimise its effects.

This TAN should be considered alongside PPW and all other relevant planning policy when preparing development plans and will be material to decisions on individual planning applications where air quality, noise or soundscape are relevant considerations.”

Section 2 states:

“Planning authorities should collaborate with relevant stakeholders, including local authority environmental health officers and pollution control specialists, to ensure that effective air quality and soundscape interventions are considered as part of developing strategies and policies for places. Developers and applicants should identify impacts on air quality and noise at the outset and involve designers, air quality specialists and acousticians in finding appropriate solutions.”

In achieving these aims the document introduces significance criteria as follows:

SOAEL – Significant Observed Adverse Effect Level

This is the level above which significant adverse effects on health and quality of life occur. It is stated that “significant adverse effects on health and quality of life should be avoided while also considering the guiding principles of sustainable development”.

LOAEL – Lowest Observed Adverse Effect Level

This is the level above which adverse effects on health and quality of life can be detected. It is stated that the second aim above lies somewhere between LOAEL and SOAEL and requires that: “all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also considering the guiding principles of sustainable development. This does not mean that such adverse effects cannot occur.”

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. This can be related to the third aim above, which seeks: “where possible, positively to improve health and quality of life through the pro-active management of noise while also considering the guiding principles of sustainable development, recognising that there will be opportunities for such measures to be taken and that they will deliver potential benefits to society. The protection of quiet places and quiet times as well as the enhancement of the acoustic environment will assist with delivering this aim.”

This is further expanded using the updated “Noise Exposure Hierarchy Table” which includes an additional level of impact referred to as the ‘No Observed Adverse Effect Level’ (‘NOAEL’). It is stated that at this level: “noise can be heard, but does not cause any change in behaviour, attitude or other physiological response”. In addition, noise at this level “can slightly affect the acoustic character of the area but not such that there is a change in the quality of life”.

The NPSE recognises that it is not possible to have a single objective noise-based measure that is mandatory and applicable to all sources of noise in all situations and provides no guidance as to how these criteria should be interpreted. It is clear, however, that there is no requirement to achieve noise

levels where there are no observable adverse impacts but that reasonable and practicable steps to reduce adverse noise impacts should be taken in the context of sustainable development and ensure a balance between noise sensitive and the need for noise generating developments.

Any scheme of noise mitigation outlined in this report will, therefore, aim to abide by the above principles of the PPW, TAN9 and TAN11 whilst recognizing the constraints of the site.

B.4 – BS8233:2014 ‘Guidance on Sound insulation and noise reduction for buildings’

BS8233 provides guidance on noise levels from sources without specific character in the built environment, based on the recommendations of the World Health Organization; specifically, ‘WHO Guidelines on Community Noise, 1999’. The Guidelines on Community Noise (1999) document defines community noise to include noise from “industries” and “construction”. The desirable criteria levels of steady state, “anonymous” noise in unoccupied spaces within dwellings, from sources such as road traffic, mechanical services and other continuously running plant, are tabulated below.

Activity	Location	Daytime (07:00 – 23:00)	Night-time (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 $L_{Aeq,8hour}$ 45 dB L_{AFmax}^*

Table 11 – BS8233:2014 Internal Ambient Noise Level Criteria

**ProPG:2017 states that’s good acoustic design can be used so that individual noise events do not normally exceed 45 dB L_{AFmax} more than 10 time a night within noise sensitive rooms such as bedrooms. However, where it is not reasonably practicable to achieve the guideline then the judgment of acceptability will depend not only on the maximum noise levels but also on factors such as the source, number distribution, predictability, and regularity of noise events.*

It is noted, however, that where development is considered necessary or desirable, despite external noise level above WHO guidelines, the above target levels may be relaxed by up to 5 dB.

General recommendations for mitigation to enable these targets to be achieved are provided, including the use of bunds and barriers to reduce external noise and space planning and sound insulation for the control of internal noise levels.

For this assessment, the above criteria are considered to be the ‘LOAEL’ as defined in the NPSE in Appendix B.

B.5 – Approved Document F Volume 1: Dwellings (2021)

Approved Document F states the following in relation to noise:

- Mechanical ventilation systems, including both continuous and intermittent mechanical ventilation, should be designed and installed to minimise noise. This includes doing all of the following.
 - o Correctly sizing and jointing ducts.
 - o Ensuring that equipment is appropriately and securely fixed, such as using resilient mountings where noise carried by the structure of the building could be a problem.
 - o Selecting appropriate equipment, including following paragraph
- For mechanical ventilation systems, fan units should be appropriately sized so that fans operating in normal background ventilation mode are not overly noisy. This might require fans to be sized so that they do not operate near maximum capacity when in normal background ventilation mode.
- Account should be taken of outside noise when considering whether openable windows are appropriate for purge ventilation.
- If an exposed façade is close to an area of sustained and loud noise (e.g. a main road), then a noise attenuating background ventilator should be fitted.

B.6 – Acoustics Ventilation and Overheating – Residential Design Guide 2020

It is suggested that the desirable internal noise criteria within BS8233:2014 should be achieved considering adequate ventilation as defined by Building Regulations 'Approved Document F' ('ADF') whole dwelling ventilation. However, for a whole dwelling ventilation system such as MVHR it is considered reasonable to allow higher levels of internal ambient noise from transport sources when higher rates of ventilation are required in relation to the overheating condition.

The 'Institute of Acoustics' ('IOA') and the 'Association of Noise Consultant's' ('ANC') have published 'The AVO Guide: 2020' document 2020. It provides guidance for those acousticians involved in the design of buildings to prevent noise ingress to and achieve reasonable internal levels. This provides valuable guidance on ventilation and overheating in support of the "Good Acoustic Design" principle advocated by ProPG. Along with guidance showing an acoustic assessment during the overheating condition, the AVO Guide (2020) provides a framework that has a two-level assessment procedure to estimate the potential impact on occupants:

Level 1 Risk Assessment

AVO 'Level 1' risk assessment criteria guide based on external free field ambient noise levels for dwellings relying on purge ventilation (e.g., opening windows) to prevent summertime overheating. AVO Guide Table 3-2 detailed in the figure below. To assess the possibility of overheating it is reasonable to relax the BS 8233:2014 internal ambient noise levels from opening a window by 5 decibels (5 dB). Also, it is assumed that a partially open window will provide a sound reduction of 13 dB. Therefore, to achieve internal noise levels in line with BS 8233:2014 the façade external noise levels should fall inside the levels shown in Table 3-2.

Risk category for Level 1 assessment ^[Note 5]	Potential Effect without Mitigation	Recommendation for Level 2 assessment
	Increasing risk of adverse effect	Recommended Optional
	Use of opening windows as primary means of mitigating overheating is not likely to result in adverse effect	Not required

Table 3-2 of AVO Guide (2020)

Figure 3 – AVO Guide Level 1 Risk Category

The AVO Guide (2020) seeks to determine the level of risk associated with overheating in a new residential development based on the existing noise climate. The AVO risk categories are detailed in the table below with clearer categorisation.

Daytime (07:00 – 23:00)	Night-time (23:00 – 07:00)	Risk Category	Mitigation
≥ 63 dB $L_{Aeq,16hour}$	≥ 55 dB $L_{Aeq,8hour}$	High Risk	Level 2 assessment recommended. Windows which are unopenable on grounds of noise will inevitably create issues for the overheating strategy.
57 – 62 dB $L_{Aeq,16hour}$	52 – 54 dB $L_{Aeq,8hour}$	Medium Risk	Level 2 assessment optional to give more confidence regarding the suitability of internal noise conditions.
54 – 56 dB $L_{Aeq,16hour}$	49 – 51 dB $L_{Aeq,8hour}$	Low Risk	
≤ 53 dB $L_{Aeq,16hour}$	≤ 48 dB $L_{Aeq,8hour}$	Negligible Risk	None required – openable windows suitable for ventilation

Table 12 – AVO Guide (2020) Level 1 Risk Assessment

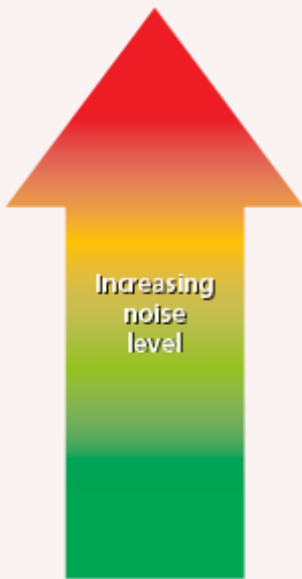
Level 2 Risk Assessment:

A 'Level 2' assessment of noise is recommended where a dwelling using purge ventilation (e.g., open windows) reaches Level 1 'High Risk' or 'Medium Risk'. The Level 2 assessment guidance comments that where internal ambient noise levels are >50 dB $L_{Aeq,16hr}$ (day) or >42 dB $L_{Aeq,8hr}$ (night) then the outcome might be that the noise causes a material change in behaviour, e.g., having to keep windows closed for the majority of the time, or there is the potential for sleep disturbance.

To conduct a Level 2 assessment, the following minimum information is required:

- Statement of the overheating criteria being applied.
- Description of the provisions for meeting the stated overheating criteria. This should include, where relevant, the area of façade opening.
- Details of the likely internal ambient noise levels whilst using provisions for mitigating overheating, and the method used to predict these.
- Estimation of how frequently and for what duration such provisions are required to mitigate overheating.
- Consideration of the effect of individual noise events.
- Assessment of the adverse effect on occupants.

The figure below outlines the AVO Guide (2020) guidance for a Level 2 assessment of noise from transport sources relating to the Overheating Condition.

Internal ambient noise level [Note 2]			Examples of Outcomes [Note 5]	
$L_{Aeq,T}$ [Note 3] during 07:00 – 23:00 [Note 6]	$L_{Aeq,sh}$ during 23:00 – 07:00	Individual noise events during 23:00 – 07:00 [Note 4]		
> 50 dB	> 42 dB	Normally exceeds 65 dB $L_{A,Fmax}$	Noise causes a material change in behaviour e.g. having to keep windows closed most of the time	Avoiding certain activities during periods of intrusion. Having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.
 Increasing noise level			Increasing likelihood of impact on reliable speech communication during the day or sleep disturbance at night	At higher noise levels, more significant behavioural change is expected and may only be considered suitable if occurring for limited periods. As noise levels increase, small behaviour changes are expected e.g. turning up the volume on the television; speaking a little more loudly; having to close windows for certain activities, for example ones which require a high level of concentration. Potential for some reported sleep disturbance. Affects the acoustic environment inside the dwelling such that there is a perceived change in quality of life. At lower noise levels, limited behavioural change is expected unless conditions are prevalent for most of the time. [Note 8]
≤ 35 dB	≤ 30 dB	Do not normally exceed $L_{A,Fmax}$ 45 dB more than 10 times a night	Noise can be heard, but does not cause any change in behaviour	Noise can be heard, but does not cause any change in behaviour, attitude, or other physiological response [Note 9]. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.

Note 1 The noise levels suggested in Tables 3-2 and 3-3 assume a steady road traffic noise source but may be adapted for other types of transport.

Table 3-3 of AVO Guide (2020)

Figure 4 – AVO Guide Level 2 Internal Ambient Noise Levels

Appendix C – Additional Plans

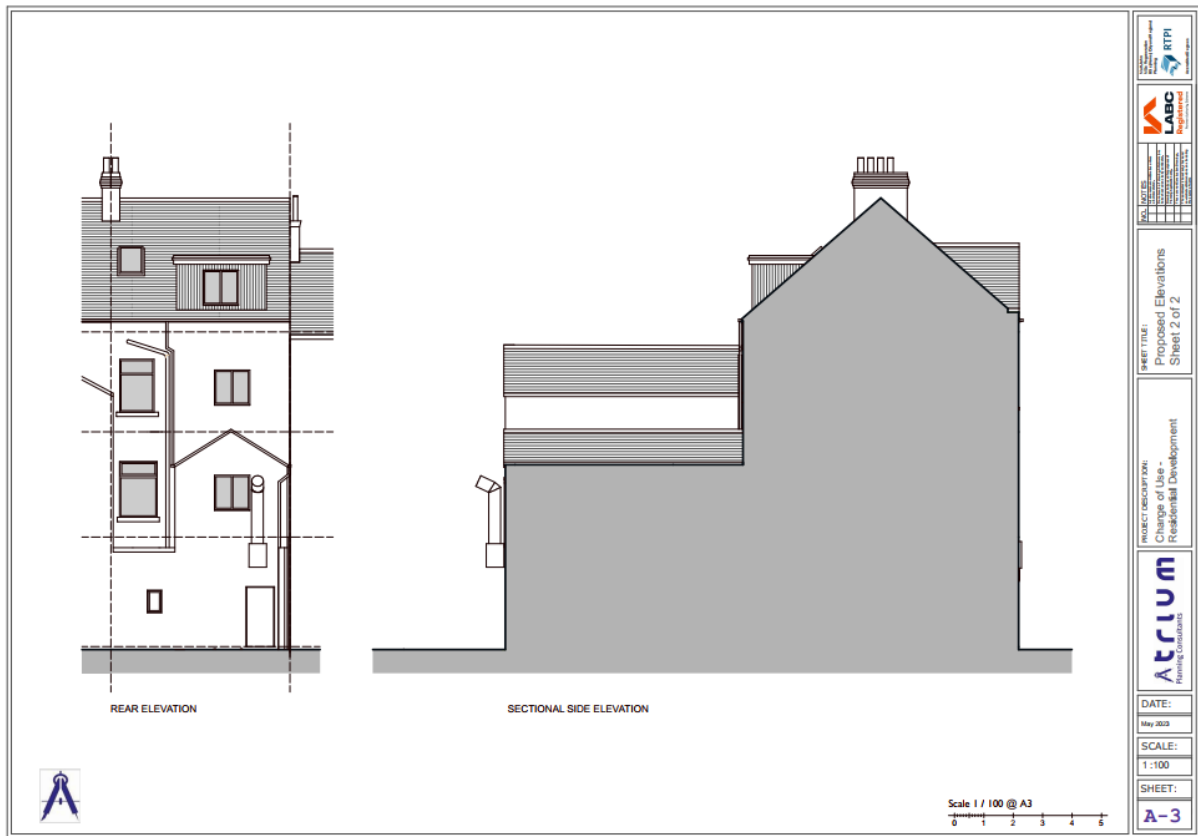


Figure 5 – Rear Elevation Drawing

Appendix D – Environmental Survey

D.1 – Time History Noise Data

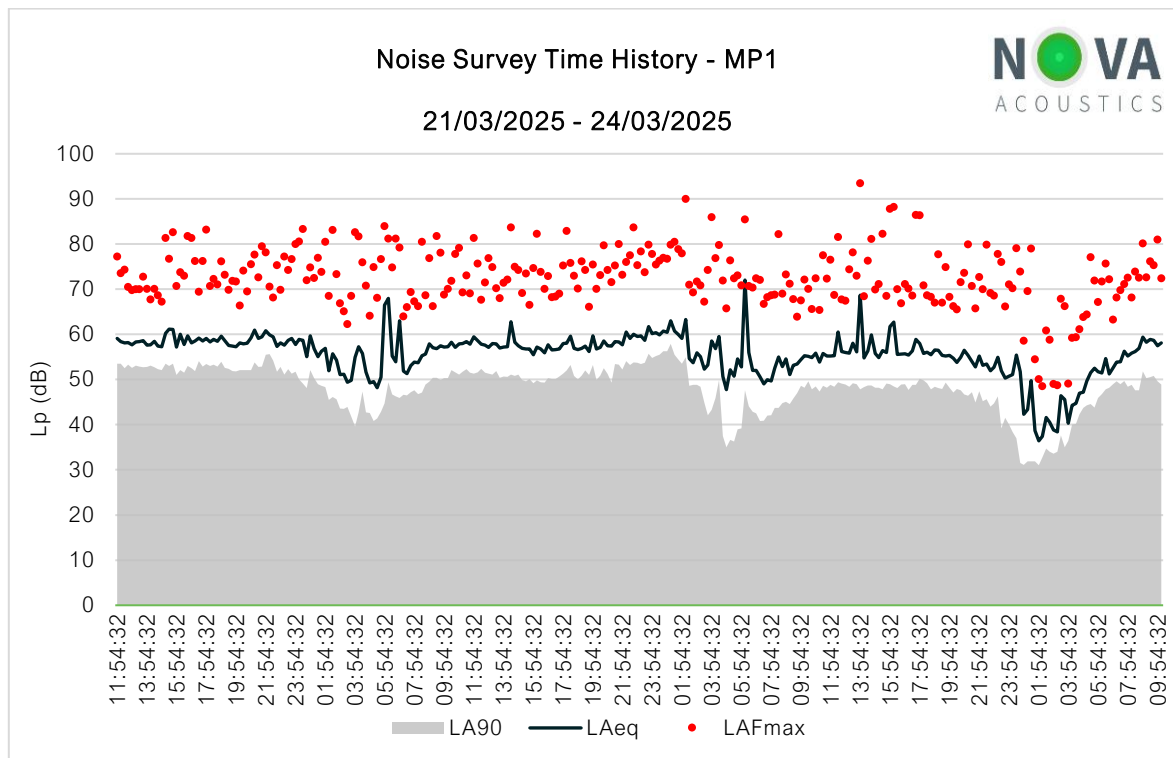


Figure 6 – MP1 Noise Survey Time History

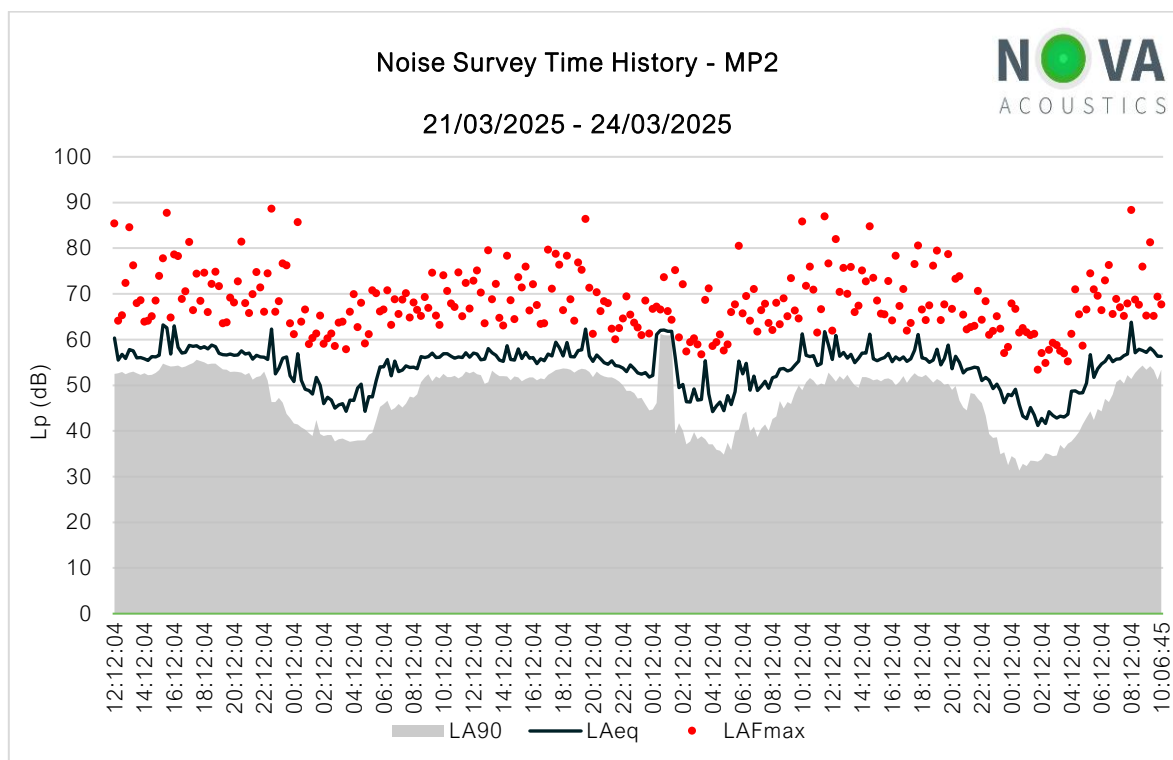


Figure 7 – MP2 Noise Survey Time History

D.2 – Surveying Equipment

Piece of Equipment	Serial No.	Calibration Deviation
Svantek SV971A Class 1 Sound Level Meter	143583	≤0.1
Svantek SV971A Class 1 Sound Level Meter	141414	0.0
Svantek SV977c Class 1 Sound Level Meter	97493	0.0
CESVA CB006 Class 1 Calibrator	901927	--

Table 13 – Surveying Equipment

All equipment used during the survey was field calibrated at the start and end of the measurement period with a negligible deviation of ≤0.1 dB. All sound level meters are calibrated every 24 months and all calibrators are calibrated every 12 months, by a third-party calibration laboratory. All microphones were fitted with a protective windshield for the entire measurements period. Calibration certificates can be provided upon request.

D.3 – Meteorological Conditions

As the environmental noise survey was carried out over a long un-manned period no localised records of weather conditions were taken. However, all measurements have been compared with met office weather data of the area, specifically the closest weather station, and 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 – Briton Ferry Cwrt Sart (Approx. 5.9km NW of Site)				
Time Period	Air Temp (°C)	Rainfall (mm/h)	Prevailing Wind Direction	Wind Speed (m/s)
21/03/2025 – 00:00 – 23:59	11.7 – 16.5	0.0 – 1.3	SE	0.0 – 6.3
22/03/2025 – 00:00 – 23:59	11.4 – 17.8	0.0	ESE	0.0 – 6.3
23/03/2025 – 00:00 – 23:59	10.1 – 15.6	0.0	SW	0.0 – 6.3
24/03/2025 – 00:00 – 23:59	4.4 – 13.1	0.0	SE	0.0 – 4.9

Table 14 – Weather Conditions

Rainfall occurred during the following periods:

- 21/03/2025 – Between 17:30 and 18:20 hours, and between 21:00 and 23:00 hours.

Appendix E – Noise Break-in Calculations

E.1 – Façades with Background Ventilation

The façade sound reduction and predicted internal noise levels are calculated assuming the following:

- The calculation method for façade sound reduction is in accordance with BS8233:2014 and BS EN 12354-3.
- The reverberation time is typically 0.5 seconds across the relevant frequency range for a furnished living room in the UK. This value is used for both living rooms and bedrooms.
- Based on the technical drawings provided to NOVA Acoustics, window areas of 1.4m² and room volumes of 28.6m³ are used in the calculations for bedrooms as a worst-case scenario. For living rooms, the calculations are based on a window area of 7.9m² and room volume of 38.3m³ as a worst-case scenario.
- The acoustic performance of the façade elements is taken from the relevant manufacturer's technical information, or the sound reduction has been predicted using INSUL 9.0.
- For background trickle ventilation a total Equivalent Area of 5000mm² per habitable room has been used in the calculations, which equates to 2 No. trickle vents (2500mm² each).

Living Room (2nd Floor, Worst-case) Day Time Leq

Item / Description	dB(A)	63	125	250	500	1k	2k	4k	8k
Measured Leq,T	60	65	57	54	58	56	51	44	37
Glazing Noise Ingress	22	42	34	24	19	6	1	-12	-19
Ventilation Noise Ingress	22		22	19	24	11	4	-9	-16
Wall Noise Ingress	6	20	14	9	4	-3	-13	-20	-27
Roof Noise Ingress									
Room Absorption Correction		1	1	1	0	0	0	-1	-3
Total Noise Ingress	29	46	38	29	28	15	9	-6	-13
NR25 & Moorhouse	30	47	41	35	28	25	21	19	17
Exceednce of Criteria	-1	-1	-3	-6	0	-10	-12	-25	-30

Bedroom (First Floor, Bed 1) Day Time Leq

Item / Description	dB(A)	63	125	250	500	1k	2k	4k	8k
Measured Leq,T	61	60	57	56	56	57	55	45	35
Glazing Noise Ingress	17	32	28	21	12	2	0	-16	-27
Ventilation Noise Ingress									
Wall Noise Ingress	9	18	17	13	5	1	-6	-16	-26
Roof Noise Ingress									
Room Absorption Correction		0	0	0	-1	-1	-1	-2	-4
Total Noise Ingress	20	36	32	24	15	7	3	-12	-24
NR25 & Moorhouse	30	47	41	35	28	25	21	19	17
Exceednce of Criteria	-10	-11	-9	-11	-13	-18	-18	-31	-41

Bedroom (First Floor, Bed 1) Night Time Leq

Item / Description	dB(A)	63	125	250	500	1k	2k	4k	8k
Measured Leq,T	60	63	60	60	58	54	50	43	30
Glazing Noise Ingress	20	35	31	25	14	-1	-5	-19	-31
Ventilation Noise Ingress									
Wall Noise Ingress	11	21	20	17	7	-2	-11	-18	-31
Roof Noise Ingress									
Room Absorption Correction		0	0	0	-1	-1	-1	-2	-4
Total Noise Ingress	23	39	35	28	17	4	-2	-15	-29
NR20 + Moorhouse	25	47	41	30	23	20	16	14	12
Exceednce of Criteria	-2	-8	-6	-2	-6	-16	-18	-29	-41

Bedroom (First Floor, Bed 1) Night Time Max

Item / Description	dB(A)	63	125	250	500	1k	2k	4k	8k
Measured Lmax	70	65	60	61	58	67	64	59	47
Glazing Noise Ingress	21	37	32	26	14	11	9	-2	-14
Ventilation Noise Ingress									
Wall Noise Ingress	15	23	20	18	7	11	3	-1	-13
Roof Noise Ingress									
Room Absorption Correction		0	0	0	-1	-1	-1	-2	-4
Total Noise Ingress	25	40	35	29	17	16	12	2	-11
NR40	45	67	56	49	43	40	37	34	33
Exceednce of Criteria	-20	-27	-21	-20	-26	-24	-25	-32	-44

Appendix F – Sound Insulation Certificate

Standardized Level Difference According to Resistance to the Passage of Sound Approved Document E Field measurements of airborne sound insulation between rooms	
Date of test: 2025-03-24	
Client:	NP-012392
Description:	See Pages 1 & 2
Area of common partition:	10.0 m ² Note:
Receiving room volume:	25.0 m ³ Name: 1st Floor Front Bedroom
Source room volume:	89.0 m ³ Name: GF Commercial

Frequency <i>f</i> Hz	<i>D_{nT}</i> (1/3 octave) dB
50	
63	
80	
100	37.1
125	35.2
160	38.1
200	40.9
250	45.9
315	50.0
400	51.2
500	53.1
630	56.2
800	57.4
1000	59.1
1250	60.7
1600	63.4
2000	65.3
2500	66.6
3150	66.6
4000	
5000	

— Measured characteristic
--- Frequency range according to the
— Curve of reference values (ISO 717-1)
--- Shifted curve

* ISO 140 - 4 maximum background noise correction applied

Rating according to ISO 717-1			
<i>D_{nT,w}</i> (C; C _{tr}) = 56 (-2 ; -7) dB	<i>C₅₀₋₃₁₅₀</i> = -3 dB	<i>C₅₀₋₅₀₀₀</i> = -2 dB	<i>C₁₀₀₋₅₀₀₀</i> = -1 dB
	<i>C_{tr,50-3150}</i> = -11 dB	<i>C_{tr,50-5000}</i> = -11 dB	<i>C_{tr,100-5000}</i> = -7 dB
Evaluation based on field measurement results obtained by an engineering method			

No. of test report: NP-012392 - A	Name of test institute: NOVA Acoustics Ltd
Date: 2025-03-24	Signature: Tom Bunting



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