

INFINITY ACOUSTICS

NOISE IMPACT ASSESSMENT

**62B Station Road,
Port Talbot,
SA13 1LZ**



Project Description:

Noise Assessment for a Residential Development

Project Reference Number:

A478MO

Amendment Register

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1. Introduction

1.1 Infinity Acoustics Ltd has been appointed to undertake a noise assessment of the proposed residential development located at 62B Station Road, Port Talbot, SA13 1LZ.

1.2 As part of the development process, the client has submitted a planning application to the Local Planning Authority (LPA), Neath Port Talbot County Borough Council. The planning application reference number and title are outlined below.

P2026/0245 - Proposed conversion of existing building into 9 No residential flats with retention of 3 No. retail units at ground floor.

1.3 The application has yet to be determined by the Local Planning Authority; however, the LPA's environmental protection team have provided the following comments in relation to noise.

The application is for a mixed commercial and residential use in a predominantly commercial area. There is also mechanical plant associated with neighbouring businesses with the potential to disturb residents. We therefore require a noise impact assessment before we are able to advise on this application.

1.4 The aim of the noise survey and assessment below is to provide the relevant information to assist the client and the local planning authority in approving the application. The noise levels at the site will be measured and assessed according to the relevant standards and local planning policy; a sound insulation scheme will be provided where necessary to ensure the amenity

of any future residents can be protected from surrounding commercial noise and that relevant criteria can be achieved.

1.5 The following noise assessment report will be undertaken in line with Planning Policy Wales 2024 and Technical Advice Note (TAN) 11 as well as the following legislation, policy and guidance.

1.6 **BS8233:2014 - Guidance on Sound Insulation and Noise Reduction In Buildings**

The general noise criteria used in the assessment will be obtained from BS8233: 2014 'Guidance on sound insulation and noise reduction for buildings'. The criteria in BS8233 are largely based on the World Health Organisation Guidelines on Community Noise. The BS8233 criteria are outlined below:

- Living Room/Bedroom - 35 dB $L_{Aeq,16hour}$ (Day)
- Dining Room – 40 dB $L_{Aeq,16hour}$ (Day)
- Bedroom – 30 dB $L_{Aeq,8hour}$ (Night)

1.7 L_{Amax} levels will also be assessed based on the criteria defined by the World Health Organisation. The WHO state within the 'Guidelines on Community Noise' that in order to avoid sleep disturbance within bedrooms during the night, the internal sound pressure level should not exceed 45 dB L_{Amax} . The frequency of L_{Amax} events should also be considered; it is understood that for an L_{Amax} noise event to adversely impact sleep, the criteria would need to be exceeded more than ten times during a nighttime period.

1.8 BS4142:2014+A1:2019 – Methods for rating and assessing industrial and commercial sound

BS4142 is a British Standard that provides guidance and a standardised methodology for assessing industrial and commercial noise sources. BS4142 outlines methods for defining specific sound levels from a given development and/or noise source. Rating penalties are then applied to account for the acoustic characteristics of the noise source. Rating penalties can be applied for the following:

- Tonality
- Impulsivity
- Intermittency

Using the subjective method, the penalties vary in magnitude depending on how perceptible the acoustic characteristic is to the human ear. The rating noise level is then compared to the underlying L_{A90} background sound level of the area without the source under assessment operating to assess the likely noise impact. The level by which the rating noise level exceeds the background L_{A90} defines the potential for noise impact. The table below outlines the relevant criteria bandings described in BS4142.

Description	Impact Rating
Rating noise levels +10 dB above the background	Significant adverse impact, depending on the context.
Rating noise levels +5 dB above the background	Adverse impact, depending on the context.
Where the rating level does not exceed the background	Low impact, dependent on Context

Table 1.0 – BS4142 Criteria

This methodology will be used to assess any clearly definable and detectable commercial activity and/or plant noise incident on the site.

2. Site & Surroundings

- 2.1 The development site is situated in the centre of Port Talbot, approximately 445m from the Port Talbot Railway Station. The area comprises a mixture of both residential and commercial units and could be described as urban.
- 2.2 Running along the front facade of the property is Station Road, connecting to the adjacent high street and outer A48 road network. This road facilitates low levels of road traffic and is primarily a pedestrianised area for shoppers and locals.
- 2.3 There are several commercial units in operation within the vicinity of the development consisting of Dale's Traditional Barber Shop, which operates from 09:00 – 17:30 Monday to Saturday, The Old Olive Kart Coffee Bar & Deli, which operates from 09:00 – 17:30 from Monday to Saturday, Haus of Boxing, which operates from 17:00 – 21:00 Monday to Friday and Port Talbot Jobcentre which operates between 09:00 – 17:00.
- 2.4 To the rear of the site is a small cul-de-sac area which provides rear access to the business and building along Station Road. Approximately 3m from the first floor window of the proposed development, there are a number of mechanical plant ventilation louvres. The noise emitted from these louvres is dominant in the area to the rear of the site. The plant is assumed to be associated with the adjacent jobcentre building.
- 2.5 The acoustic environment surrounding the front of the site could generally be considered as mixed with both distant road noise and noise from shoppers and patrons using the local amenities and buskers. To the rear of the site, the acoustic environment was considered to be dominated by mechanical plant noise, with distant road noise being secondary in nature.
- 2.6 The existing building is in a significant state of disrepair and is formed from masonry facades and timber flooring 250 – 275mm deep; timber truss and

tile roof. Along the front façade, the glazing had been largely removed, and to the rear the glazing was again in a state of disrepair and/or smashed. The glazing that remained at the site was a mixture of standard double glazing and single-glazed timber frame systems.

- 2.7 On the ground floor, the development site contained a dilapidated and disused club/snooker bar and a disused retail unit. The only unit on the ground floor that was in operation during the visit was Dale's Traditional Barber Shop. It is assumed that the ground floor will be renovated and retained as retail throughout. The client has indicated the club will not re-open.
- 2.8 At first floor level the development shares a party wall with Haus of Boxing Gym which operates between 17:00 – 21:00; as such, noise breakthrough through the adjoining floor with commercial below and adjoining walls with the commercial units at 1st floor will be considered in the assessment below.
- 2.9 The figure below indicates the development site, surrounding area and noise survey measurement locations.



Figure 1.0 – Development site and surroundings

3. Survey

3.1 A noise survey of the site was undertaken between Friday the 7th of August and Monday the 10th of August 2026.

3.2 The following equipment was used to undertake the noise survey. All equipment used was field calibrated at 1kHz with a tolerance of less than 0.2 dB drift before and after the measurement. Calibration certificates for the equipment can be provided upon request.

- SVAN 971A Class 1 Sound Level Meter – SN – 139441
- MIRUS GA117 Class 1 Sound Level Meter – SN – 35781
- SVAN SV33B Class 1 Calibrator – SN – 122241

3.3 The long-term noise meter and associated microphone at Measurement Location 1 (ML1) were located outside the first-floor window along the front façade of the development. The microphone was situated approximately 1m from the façade of the building.

The long-term noise meter and associated microphone at Measurement Location 2 (ML2) were located outside the first-floor window along the rear façade of the development. The microphone was located approximately 1m from the façade of the building.

Given the proximity of both microphones to the façades of the development, a 3 dB façade correction will be applied to all the measured data to establish free-field noise levels as stipulated in BS8233.

3.4 The weather during the setup of the equipment is outlined below:

- 20.0 Degrees Celsius
- SW wind with speeds of 3.0m/s

- No cloud coverage and no precipitation

During the collection of the equipment, the weather was as follows:

- 17.0 Degrees Celsius
- SW wind with speeds of 4.2m/s
- Low cloud coverage and no precipitation

3.5 Generally, the weather across the majority of the survey complied with the requirements of BS 7445-2. A full weather summary for the duration of the survey is outlined in the table below and has been taken from the nearest functioning weather station.

Weather Data	
Description	Data
Temp (C)	8.3 – 26.9
Rainfall (mm)	0.0
Wind Speed (m/s)	0.0 – 6.3
Prevailing Wind	WSW
Relative Mean Humidity (%)	68.4

Table 2.0 – Weather Data

3.6 The results of the ambient noise survey are presented in the tables below and will be used in the subsequent noise assessment. A full noise survey time history can be found in Appendix C.

16 & 8 Hour Results ML1				
Period and Date	Time Period	L _{Aeq} (dB)	L _{Afmax} (dB)	L _{A90} (dB)
Day – 07/08/2026	12:45 – 23:00	56.0	95.0	44.0
Night – 07/08/2026	23:00 – 07:00	47.0	80.0	36.0
Day – 08/08/2026	07:00 – 23:00	55.0	98.0	43.0
Night – 08/08/2026	23:00 – 07:00	45.0	73.0	35.0
Day – 09/08/2026	07:00 – 23:00	56.0	88.0	42.0
Night – 09/08/2026	23:00 – 07:00	44.0	79.0	34.0
Day – 10/08/2026	07:00 – 08:00	49.0	73.0	39.0

ML1 L _{Afmax} Analysis	
Time Period	10 th Highest L _{Afmax,1min}
Night	71.0

Table 3.0 – Noise Survey Global Data ML1

1/1 Octave Band Leq – Measurement Location 1 (Hz) (dB)								
Description	63	125	250	500	1k	2k	4k	A
Highest L _{Zeq,1hour}	66.0	64.0	58.0	58.0	55.0	60.0	53.0	62.0
Highest L _{Zeq,1hour}	54.0	49.0	47.0	49.0	46.0	47.0	42.0	51.0

Table 4.0 – Noise Survey Octave Band Data ML1

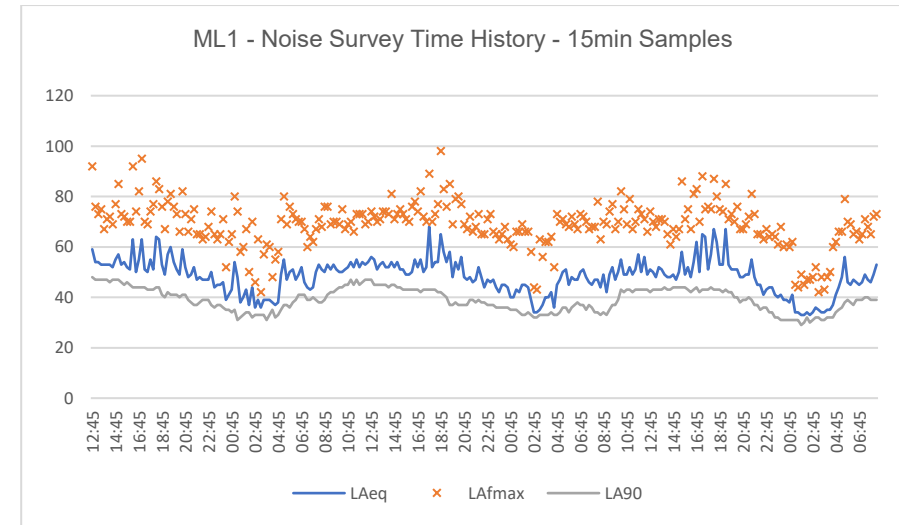


Figure 2.0 – Noise Survey – Front Façade

3.7 A review of the results at the front façade indicates moderate to low noise levels in this location. The time history indicates shorter periods of elevated noise, which are to be expected in a mixed source environment of a commercial/urban nature. Along this façade, there are no clear indications of mechanical plant noise being present or dominant. Given the mixed source nature of the environment to the front façade of the site, instead of utilising the typical 16-hour and 8-hour criteria, the loudest measured 1-hour period in both day and night will be used instead. This will ensure the future residents can be protected from all noise sources in the area along the front façade of the building, including road noise and commercial activity and patron noise in the area.

16 & 8 Hour Results ML2				
Period and Date	Time Period	L _{Aeq} (dB)	L _{Afmax} (dB)	L _{A90} (dB)
Day – 07/08/2026	12:30 – 23:00	51.0	83.0	48.0
Night – 07/08/2026	23:00 – 07:00	49.0	72.0	45.0
Day – 08/08/2026	07:00 – 23:00	51.0	79.0	49.0
Night – 08/08/2026	23:00 – 07:00	47.0	78.0	39.0
Day – 09/08/2026	07:00 – 23:00	51.0	93.0	40.0
Night – 09/08/2026	23:00 – 07:00	50.0	71.0	48.0
Day – 10/08/2026	07:00 – 09:00	53.0	78.0	50.0
ML2 L _{Afmax} Analysis				
Time Period		10 th Highest L _{Afmax,1min}		
Night		69.0		

Table 5.0 – Noise Survey Global Data ML2

1/1 Octave Band Leq – Measurement Location 2 (Hz) (dB)								
Description	63	125	250	500	1k	2k	4k	A
Highest L _{Zeq,1hour}	59.0	57.0	55.0	51.0	53.0	50.0	44.0	56.0
Highest L _{Zeq,1hour}	57.0	56.0	55.0	50.0	50.0	46.0	42.0	54.0

Table 6.0 – Noise Survey Octave Band Data ML2

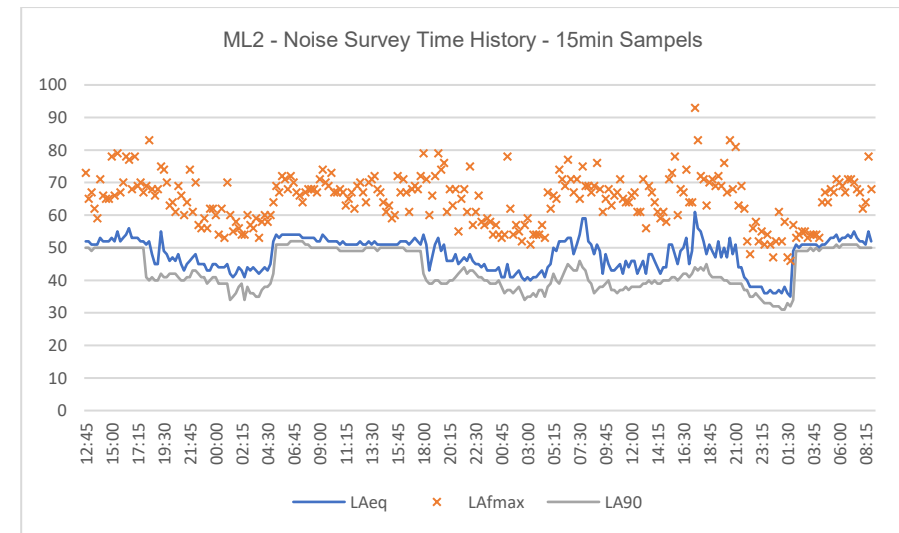


Figure 3.0 – Noise Survey - Rear Façade

3.8 The noise survey at the rear of the site indicates noise levels in this location are lower than those measured at the front façade of the building. A review of the time history indicates that generally the noise incident on the rear façade is dominated by the emission from the ventilation louvres. The time history indicates that the periods of elevated plant noise are present throughout the night, and therefore, the highest 1-hour measurement during the daytime and nighttime, at this location, will be used in the assessment below. This approach will ensure that the future residents can be protected from mechanical plant noise ingress from the external environment.

4. BS4142 Screening Assessment

4.1 A review of the noise levels and acoustic environment at the site indicates that commercial plant in the area is clearly definable above the residual acoustic environment, specifically at the rear façade of the development. When assessed in accordance with BS4142, identified commercial plant noise would fall significantly above the background sound level of the area and thus indicate the potential for significant adverse impact. However, it is apparent that the client has no control over the commercial plant noise and operations at the adjacent site.

4.2 In relation to scenarios where new residential dwellings are introduced into an area with commercial or industrial noise, BS4142 states the following:

'Where a new noise-sensitive receptor is introduced and there is extant industrial and/or commercial sound, it should be recognised that the industrial and/or commercial sound forms a component of the acoustic environment. In such circumstances, other guidance and criteria in addition to or alternative to this standard can also inform the appropriateness of both introducing a new noise-sensitive receptor and the extent of required noise mitigation.'

BS4142 also states:

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

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

- i) facade insulation treatment;*
- ii) ventilation and/or cooling that will reduce the need to have windows open so as to provide rapid or purge ventilation; and*
- iii) acoustic screening.*

4.3 Given the above commentary and guidance from BS4142, and the fact that mitigation cannot be applied at source, mitigation at the receiver will be advised. As stated in BS4142, alternative criteria and standards can be used to assess the impact of commercial noise on new residential dwellings, and the likely noise impact should be assessed with the inclusion of noise mitigation measures such as façade insulation, noise barriers and sufficient ventilation. Thus, residents would be fully protected from surrounding commercial plant noise sources to the rear façade provided the sound insulation scheme and recommendations are sufficient to achieve the relevant internal noise criteria.

4.4 To provide a robust and conservative assessment ensuring the sound insulation scheme at the rear achieves the relevant criteria, whilst also accounting for acoustic features associated with the noise in the form of corrections analogous to the BS4142 rating penalties, will ensure protection. Given this, the highest measured 1-hour plant noise period in the day and night will be used in the assessment along the rear facade, and appropriate corrections will be applied to the internal noise criteria on facades exposed to potential commercial plant noise from the adjacent site to account for any BS4142 rating penalties. In this instance, a conservative 4 dB adjustment has been applied to the internal noise criteria to account for the tonal characteristics observed from the plant. It is concluded that, provided the above approach is undertaken and adopted internal noise criteria are achieved, the amenity of all future residents can be fully protected from commercial noise.

5. Sound Insulation Scheme and Recommendations

5.1 The following section of the report details the sound insulation scheme required to ensure internal noise criteria can be achieved and that future residents are protected from noise ingress from the external environment. Prior approval of the sound insulation scheme should be sought from the local authority before any of the works outlined below are implemented.

5.2 Facades & Roof

During the site visit, the facades were noted as masonry assumed to be a minimum of 210mm. This is a heavyweight construction and as such is deemed to provide sufficient sound reduction. When modelled in INSUL 10.0.6, typical wall constructions such as this are found to provide a minimum of 50 dB R_w .

The plans indicate that there will be roof lights and potentially rooms within the roof space. Where roof spaces are not utilised as voided lofts with thermal insulation, the following minimum detail should be installed.

- Roof Tiles
- 25mm Timber roofing batten
- Minimum 100mm timber roof truss
- Minimum 100mm Insulation 32kg/m²
- Resilient bar system affixed to the underside of the roof
- No.1 layer of 12.5mm Plasterboard (Min mass 8kg/m²)

Expected Performance: 53 dB R_w .

5.3 Glazing

To ensure the amenity of the future residents can be protected, the minimum sound reduction defined in the section below should be achieved by all glazing. The following glazing units are sufficient to achieve said performance and could be installed along each facade zone for both

bedrooms and living rooms. To allow ease of assessment, the glazing below can be installed on all facades and roof lights.

Glazing Sound Reduction Front Facade							
6mm Glass / 16mm Air Cavity / 4mm Glass (32 dB R_w / 28 dB R_w +ctR)							
Description	63	125	250	500	1k	2k	4k
1/1 Sound Reduction	19.0	21.0	20.0	26.0	38.0	37.0	39.0

Table 7.0 – Proposed Glazing Sound Reduction

The glazing in the table above has been taken from the Pilkington database however any other glazing capable of achieving the minimum required sound reduction, as outlined in the table above, would be sufficient and thus could be installed.

5.4 Ventilation

An open window Assessment has been undertaken and is presented in Appendix D2; it has been found that the windows along the front and rear of the site cannot be used for ventilation whilst still achieving appropriate internal noise levels, assuming an open window. Further to this, the AVO Guide assessment indicates that there is a 'Medium Risk' of overheating conditions occurring within the dwellings due to residents keeping windows closed to avoid noise ingress. Given this and due to the fact there is significant potential for mechanical plant noise impact during the day and night time at the rear of the site, an alternative ventilation system should be employed across the site,

System 4, outlined in the Building Regulations Approved Document F and the AVO Guide, should be sufficient for the development. System 4 outlines the use of a full mechanical ventilation Heat Recovery System (MVHR), as indicated in the figure below. MVHR is a centralised system ducted to supply

outlets in living rooms and bedrooms as well as to extract in wet rooms. It is assumed that the residents can still use open windows for purge ventilation and rapid dispersion of moisture and odour.

An overheating assessment is required to inform the design of the MVHR system. The proposed ventilation system should be designed to be sufficient to prevent overheating and provide sufficient ventilation, assuming windows are closed throughout the development.



Figure 4.0 – Proposed Ventilation System

Internal mechanical ventilation, such as extract systems, produces self-generated noise which needs to be fully considered. The following criteria should be achieved by any mechanical ventilation systems employed at the site. The criteria below have been defined by the ANC in consultation on the Future Home Standards 2019 and the AVO Guide 2020.

Whole-dwelling ventilation system noise should not exceed:

- 26 dB $L_{Aeq,t}$ in Bedrooms
- 30 dB $L_{Aeq,t}$ in Living rooms

This would apply to Mechanical Extract Ventilation (MEV) and Mechanical Ventilation with Heat Recovery (MVHR) systems.

Extract ventilation system noise should not exceed:

- 26 dB $L_{Aeq,t}$ in Bedrooms
- 35 dB $L_{Aeq,t}$ in Living rooms
- 45 dB $L_{Aeq,t}$ in Kitchens and Bathrooms

This would apply to intermittent fans used with natural ventilation as well as MEV and MVHR.

5.5 Separating Floor Construction

The following floor detail should be implemented to ensure noise breaking through from the ground floor units can be reduced to an appropriate level and ensure the amenity of future residents can be protected.

- 22mm Flooring particle board
- Minimum 250mm timber joists with a minimum 100mm insulation, min density 45kg/m³
- No. 2 layers of 12.5mm Sound Bloc plasterboard or Fireline plasterboard where required (Min mass 9.8kg/m² per board).
- Suspended MF Ceiling on acoustic hangers, min drop 325mm
- Minimum 100mm Insulation within the new ceiling void (Min density 45kg/m³)
- MF ceiling lined with 2no. layers of 15mm standard plasterboard (Min mass 9.8kg/m² per board).

Expected Performance: 53 dB $D_{nt,w} + C_{tr}$

5.6 Separating Wall Construction

The following Wall detail should be implemented to ensure noise breaking through from the 1st floor adjacent commercial units can be reduced to an appropriate level and ensure the amenity of future residents can be protected.

- Existing masonry wall (Min 200mm)
- Minimum 25mm air cavity
- 75mm Independent timber stud with 75mm insulation (Min density 45kg/m³)
- 2 Layers of 15mm Sound Bloc plasterboard (Min surface mass 12.6kg/m² per board)

Expected Performance: 65 dB $D_{nt,w} + C_{tr}$

5.7 Other Considerations

The sound insulation performance of any product or construction detail is largely dependent on high levels of workmanship and the installation of the correct materials. Particular attention should be given to sealing gaps and holes throughout construction and ensure the correct material densities and mass requirements are met by all products. Where specialist products are used, manufacturer installation guides should be followed in detail. Where glazing is installed, specific test certificates demonstrating acoustic performance of the glass and frame should be provided by the installer prior to installation to ensure compliance. Separating elements such as walls and floors between uses are also required to provide a degree of resistance to fire stipulated in Part B of the Building Regulations. Prior to the installation of any construction details, all details should be reviewed by a suitably qualified person to ensure compliance.

6. Noise Break-In Assessment

6.1 The following section of the report presents the calculated internal noise levels within the development, considering the sound insulation scheme above has been implemented.

6.2 In order to calculate the internal noise levels within the development complex, noise break-in calculations have been undertaken using the Apex Method, which is based on the complex methodology in BS8233 and BS12354 - 3. Full break-in calculations can be seen in Appendix D.

6.3 The table below indicates the internal noise levels within the bedrooms and living rooms on each façade, considering the sound insulation scheme outlined in Section 5.0 has been implemented.

Noise Break-In Assessment Results – Front Façade				
Location	Description	Calculated Internal Noise Level (dBA)	Internal Criteria (dBA)	Criteria Achieved
Front Façade	Living Room Day	34.0	35 dB $L_{Aeq,1hour}$	Yes
	Bedroom Day	34.0	35 dB $L_{Aeq,1hour}$	Yes
	Bedroom Night	23.0	30 dB $L_{Aeq,1hour}$	Yes
	Bedroom Night	39.0	45 dB $L_{Amax,t}$	Yes

Table 8.0 – Noise Break-In Assessment Results – Front Façade

Noise Break-In Assessment Results – Rear Façade				
Location	Description	Calculated Internal Noise Level (dBA)	Internal Criteria (dBA)	Criteria Achieved
Rear Façades	Living Room Day	25.0	*31 dB $L_{Aeq,1hour}$	Yes
	Bedroom Day	26.0	*31 dB $L_{Aeq,1hour}$	Yes
	Bedroom Night	25.0	*26 dB $L_{Aeq,1hour}$	Yes
	Bedroom Night	34.0	45 dB $L_{Amax,t}$	Yes

Table 9.0 – Noise Break-In Assessment Results – Rear Façade

*BS4142 Rating Penalty Applied

6.4 As can be seen in the assessment above, provided the proposed sound insulation scheme and recommendations outlined in Section 5.0 of the report above are implemented, the required internal noise criteria can readily be achieved, and the amenity of all future residents can be fully protected.

6.5 To provide a robust assessment in areas and time periods where commercial noise is apparent, the highest measured 1-hour periods have been utilised. Further to this, on facades with the potential for plant noise impact, the internal noise criteria have been reduced to reflect the acoustic feature penalties outlined in BS4142. Even when considering this robust assessment methodology, it is expected that the sound insulation scheme will be sufficient to achieve the adopted criteria, and therefore the amenity of all residents can be fully protected from commercial noise and activity in the area.

7. Noise Breakthrough Assessment

7.1 The following section of the report undertakes a noise breakthrough assessment of the retail and activity noise breaking through the floor and wall of the development into the residential sections of the building, considering the floor upgrades and wall in Section 5.0 of the report have been implemented.

7.2 The assessment of the floor to the retail units below has been undertaken assuming internal noise levels within the retail unit of 80 dBA, which is deemed robust and aligns with the Noise at Work Regulations 2005. Further to this, to account for the non-anonymous nature of the retail noise, the daytime bedroom noise criteria have been reduced by 5 dB.

Noise Breakthrough Assessment					
Separating Element	Retail Noise Level (dBA)	Expected Performance (dB, D _{nt,w+ctr})	Noise Level in Dwelling (dBA)	Criteria (dBA)	Criteria Achieved
Floor	80.0	53.0	27.0	30.0	Yes

Table 10.0 – Noise Breakthrough Assessment Floor

7.3 Directly adjoining the site via the wall is a boxing club; it is assumed that the boxing club will utilise a degree of music during the classes. Further to this, L_{AFmax} events from bag strikes and shouts may be apparent. As such, a 1/1 octave band L_{eq} noise breakthrough and L_{AFmax} noise breakthrough assessment has been undertaken below, assuming amplified music and the L_{AFmax} noise levels from a shout, as well as the sound reduction of the proposed wall upgrade in Section 5.0 of the report. The criteria used in the assessment are the NR 20 noise rating curve, which equates to a global value of 25 dB.

Description	Noise Breakthrough Wall 1/1 Octave Band (Hz, dB)								L _{Afmax}
	63	125	250	500	1k	2k	4k	A	
Noise Level in Boxing Gym	80.0	85.0	85.0	85.0	85.0	85.0	80.0	88.0	90.0
R Wall (R/D _{nt,w+ctr})	39.0	56.0	79.0	96.0	97.0	98.0	99.0	65.0	65.0
Level in Flat	41.0	29.0	6.0	0.0	0.0	0.0	0.0	23.0	25.0
Criteria NR20/25 dBA	51.0	39.0	31.0	24.0	20.0	17.0	14.0	25.0	25.0
Level Above Criteria	-10.0	-10.0	-25.0	-24.0	-20.0	-17.0	-14.0	-2.0	0.0

Table 11.0 – Noise Breakthrough Assessment Wall

7.4 As can be seen in the assessments above, provided the sound insulation scheme outlined in Section 5.0 of the report is implemented, the noise levels within the dwellings due to noise breakthrough will fall within appropriate acoustic criteria, and the amenity of all future residents can be protected from the surrounding noise sources.

8. Conclusion

8.1 In conclusion, a noise survey has been undertaken at 62B Station Road, Port Talbot, Neath, Port Talbot, SA13 1LZ. The noise levels obtained during the survey have allowed a noise assessment to be undertaken in order to calculate the requirements for a sound insulation scheme to ensure the amenity of future residents can be protected.

8.2 As a result of the noise assessment, a sound insulation scheme and further mitigation measures have been defined in Section 5.0 to ensure all the criteria outlined in BS8233:2014 can be achieved. The effectiveness of the sound insulation scheme has been assessed in Sections 6.0 and 7.0. Provided the sound insulation scheme and recommendations are installed and retained thereafter, the amenity of future residents can be fully protected, and all criteria should be achieved. Prior to the commencement of any works or implementation of the sound insulation works, the above assessment should be fully approved by the local authority.

APPENDIX A – List of Terms and Glossary

The following section of the report outlines a glossary of terms used in the assessment to assist the reader in understanding the assessment above, which is, by necessity, technical in nature.

Decibel DB - The decibel, often denoted as dB, is the logarithmic unit used to describe the magnitude of sound or noise levels. The typical range of sound pressure levels is from 0 dB, defined as the threshold of hearing, to 120 dB, defined as the threshold of pain.

Frequency Hz – As well as the decibel sound and noise, is also measured and defined in frequency. Frequency or Hertz (Hz) is an expression of the number of cycles a sound wave will complete per second. Larger frequencies may be expressed in kilohertz (kHz). The typical range of human hearing is from 20 Hz to 20,000Hz; however, with age, the audible frequency range decreases in most humans.

A - Weighting – The A-weighting is the most commonly used weighting curve taken from IEC 61672:2003 and is applied to sound pressure level measurements. The A-weighting is applied to measured sound levels to account for the loudness perceived by the human ear, as the ear is less sensitive to low audio frequencies.

LAeq - The A-weighted 'equivalent continuous noise level', which is an average of the total sound energy measured over any given time period. L_{Aeq} is the level of a continuous noise that has the same total (A-weighted) energy as the real fluctuating noise, measured over the same time period. The A-weighting represents a curve that is applied to the measured noise levels to represent the way the human auditory system perceives sound.

LAfmax - The maximum A-weighted noise level that was recorded during the monitoring period using a fast time weighting. This acoustic parameter represents more transient sound levels within the acoustic environment, which may only occur for a few seconds or minutes.

LA10 - This is the A-weighted noise level exceeded for 10% of a given time period. This parameter is typically used to measure and predict road traffic noise.

LA90 - This is the A-weighted noise level exceeded for 90% of any given time period. Generally, this acoustic parameter represents the underlying background sound level in a given area and doesn't generally include transient or short-term noise events that may occur within the surroundings.

Sound Pressure – Sound pressure is the difference between the instantaneous pressure at a point in the presence of a sound wave and the static pressure of the medium. Sound pressure fluctuates due to refractions and compressions of air molecules.

Sound Reduction Index – The sound reduction index, denoted by the parameter 'R', is the laboratory-measured sound reduction given material or construction. R is measured in 1/3 octave band frequencies. The R_w sound insulation parameter stands for the weighted standardised sound reduction index and is a single-figure global rating of the sound insulation of a given material or construction.

APPENDIX B – Site Plans

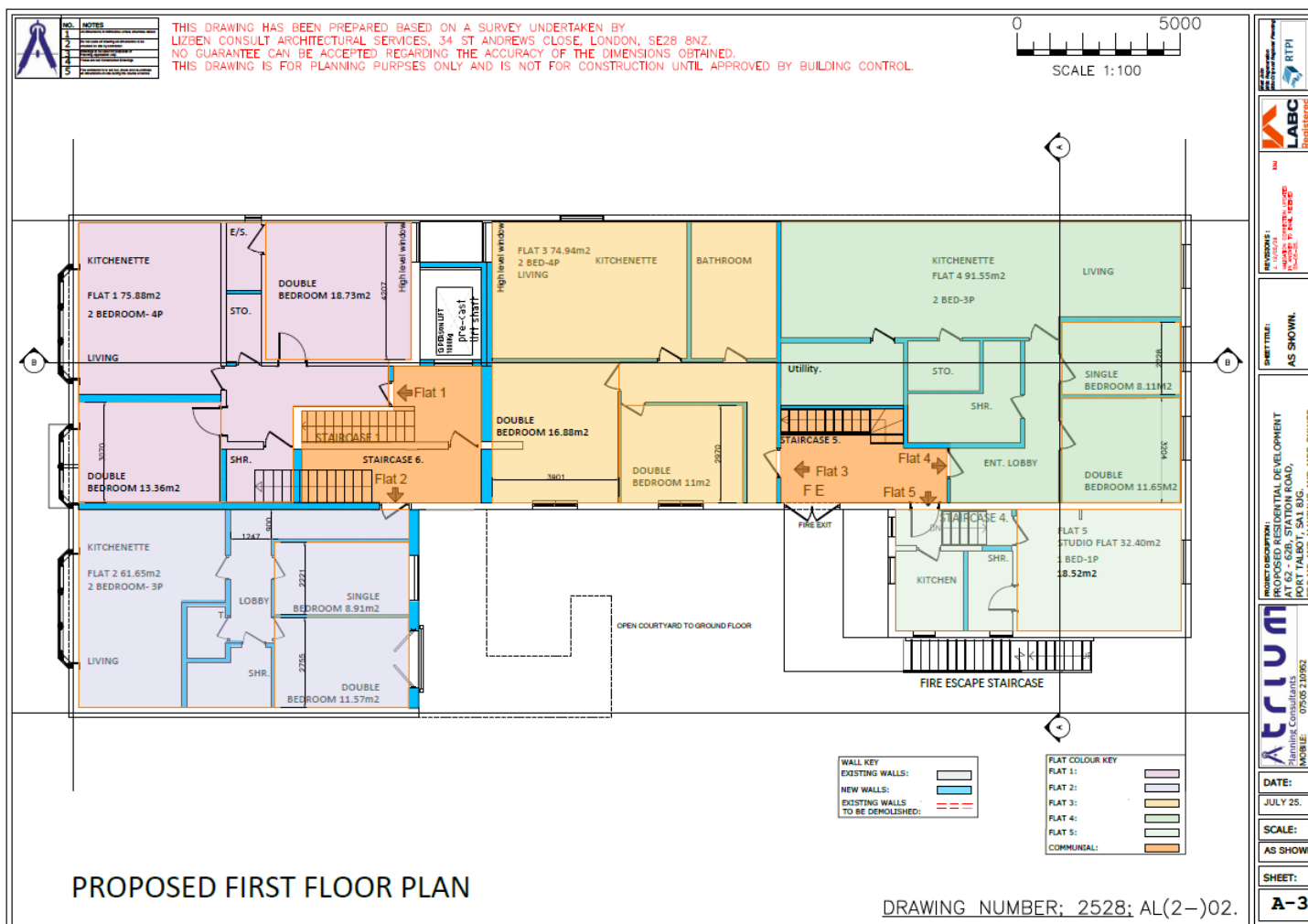


Figure 5.0 – Site Plan – First Floor

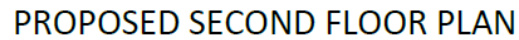


Figure 6.0 – Site Plan – Second Floor

APPENDIX D –Calculations

D.1 – BS8233 Noise Break-In Assessment

Complex Noise Break In Calculations - Front

Calculation Specifics	
Room Name	Bedroom
Room Volume (m3)	43.5
Window Area (m2)	6.5
Reverb Time (Secs)	0.5
Number of Trickle Vents	0

LAeq,1hours (dB) Day Time	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz
External Free Field Noise (dBZ)	66.0	64.0	58.0	58.0	55.0	60.0	53.0
6mm/16mm Air/4mm	19.0	21.0	20.0	26.0	38.0	37.0	39.0
Noise Through Glazing L2	46.7	42.7	37.7	31.7	16.7	22.7	13.7
No Vents MVHR Advised	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Noise Through Vent L2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Noise Break in (dBZ)	47.0	43.0	38.0	32.0	17.0	23.0	14.0
A Weighting Curve	-26.2	-16.2	-8.7	-3.2	0.0	1.2	1.0
Total Noise Break in (dBA)	20.8	26.8	29.3	28.8	17.0	24.2	15.0
Total Global Noise Break in (dBA)	34.1						
Complies with 35 dB Criteria?	Yes						

LAeq,1hours (dB) Night Time	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz
External Free Field Noise (dBZ)	54.0	49.0	47.0	49.0	46.0	47.0	42.0
6mm/16mm Air/4mm	19.0	21.0	20.0	26.0	38.0	37.0	39.0
Noise Through Glazing L2	34.7	27.7	26.7	22.7	7.7	9.7	2.7
No Vents MVHR Advised	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Noise Through Vent L2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Noise Break in (dBZ)	35.0	28.0	27.0	23.0	8.0	10.0	3.0
A Weighting Curve	-26.2	-16.2	-8.7	-3.2	0.0	1.2	1.0
Total Noise Break in (dBA)	8.8	11.8	18.3	19.8	8.0	11.2	4.0
Total Global Noise Break in (dBA)	23.2						
Complies with 30 dB Criteria?	Yes						

Lafmax,t (dB) Night Time	(dBA)
External Free Field Lafmax L1,ff (dBA)	71.0
6mm/16mm Air/4mm	32.0
Noise Through Glazing L2	38.7
No Vents MVHR Advised	0.0
Noise Through Vent L2	0.0
Total Noise Break in (dBA)	39.0
Complies with 45 dB Criteria?	Yes

Complex Noise Break In Calculations - Front

Calculation Specifics	
Room Name	Living Room
Room Volume (m3)	70.4
Window Area (m2)	11.4
Reverb Time (Secs)	0.5
Number of Trickle Vents	0

LAeq,1hours (dB) Day Time	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz
External Free Field Noise (dBZ)	66.0	64.0	58.0	58.0	55.0	60.0	53.0
6mm/16mm Air/4mm	19.0	21.0	20.0	26.0	38.0	37.0	39.0
Noise Through Glazing L2	47.1	43.1	38.1	32.1	17.1	23.1	14.1
No Vent MVHR Advised	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Noise Through Vent L2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Noise Break in (dBZ)	47.0	43.0	38.0	32.0	17.0	23.0	14.0
A Weighting Curve	-26.2	-16.2	-8.7	-3.2	0.0	1.2	1.0
Total Noise Break in (dBA)	20.8	26.8	29.3	28.8	17.0	24.2	15.0
Total Global Noise Break in (dBA)	34.1						
Complies with 35 dB Criteria?	Yes						

Complex Noise Break In Calculations - Rear

Calculation Specifics	
Room Name	Bedroom
Room Volume (m3)	20.3
Window Area (m2)	1.7
Reverb Time (Secs)	0.5
Number of Trickle Vents	0

L _{Aeq,1hours} (dB) Day Time	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz
External Free Field Noise (dBZ)	59.0	57.0	55.0	51.0	53.0	50.0	44.0
6mm/16mm Air/4mm	19.0	21.0	20.0	26.0	38.0	37.0	39.0
Noise Through Glazing L2	37.2	33.2	32.2	22.2	12.2	10.2	2.2
No Vent MVHR	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Noise Through Vent L2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Noise Break in (dBZ)	37.0	33.0	32.0	22.0	12.0	11.0	3.0
A Weighting Curve	-26.2	-16.2	-8.7	-3.2	0.0	1.2	1.0
Total Noise Break in (dBA)	10.8	16.8	23.3	18.8	12.0	12.2	4.0
Total Global Noise Break in (dBA)	25.8						
Complies with 31 dB Criteria?	Yes						

L _{Aeq,1hours} (dB) Night Time	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz
External Free Field Noise (dBZ)	57	56.0	55.0	50.0	50.0	46.0	42
6mm/16mm Air/4mm	19.0	21.0	20.0	26.0	38.0	37.0	39.0
Noise Through Glazing L2	35.2	32.2	32.2	21.2	9.2	6.2	0.2
No Vent MVHR	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Noise Through Vent L2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Noise Break in (dBZ)	35.0	32.0	32.0	21.0	10.0	7.0	1.0
A Weighting Curve	-26.2	-16.2	-8.7	-3.2	0.0	1.2	1.0
Total Noise Break in (dBA)	8.8	15.8	23.3	17.8	10.0	8.2	2.0
Total Global Noise Break in (dBA)	25.3						
Complies with 26 dB Criteria?	Yes						

L _{Afmax,t} (dB) Night Time	(dBA)
External Free Field L _{Afmax} L1,ff (dBA)	69.0
6mm/16mm Air/4mm	32.0
Noise Through Glazing L2	34.2
No Vent MVHR	0.0
Noise Through Vent L2	0.0
Total Noise Break in (dBA)	34.0
Complies with 45 dB Criteria?	Yes

Complex Noise Break In Calculations - Rear

Calculation Specifics	
Room Name	Living Room
Room Volume (m3)	112.5
Window Area (m2)	7.3
Reverb Time (Secs)	0.5
Number of Trickle Vents	0

L _{Aeq,1hours} (dB) Day Time	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz
External Free Field Noise (dBZ)	59.0	57.0	55.0	51.0	53.0	50.0	44.0
6mm/16mm Air/4mm	19.0	21.0	20.0	26.0	38.0	37.0	39.0
Noise Through Glazing L2	36.1	32.1	31.1	21.1	11.1	9.1	0.0
No Vent MVHR	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Noise Through Vent L2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Noise Break in (dBZ)	36.0	32.0	31.0	21.0	11.0	10.0	0.0
A Weighting Curve	-26.2	-16.2	-8.7	-3.2	0.0	1.2	1.0
Total Noise Break in (dBA)	9.8	15.8	22.3	17.8	11.0	11.2	1.0
Total Global Noise Break in (dBA)	24.8						
Complies with 31 dB Criteria?	Yes						

D.2 – BS8233 Open Window Assessment

The assessment below has been undertaken assuming a 13 dB attenuation from an open window to establish the internal noise levels. BS8233 states that where development is desirable, noise criteria can be relaxed by 5 dB. The AVO Guide indicates that at levels approximately 5 dB above the criteria there would be a low risk of overheating. Document O of the Building Regulations also stipulates internal levels of 40 dB $L_{Aeq,8hours}$ or below and L_{Amax} levels not regularly exceeding 55 dB are sufficient when using open windows for ventilation and prevention of overheating.

BS8233 Open Window Assessment						
Location / Time Period	Façade Zone	External Level (dBA)	Internal Noise Level (dBA)	BS8233 Criteria (dBA)	Exceedance (dBA)	AVO Guide Assessment
Bedroom / Living Room Day	Front Red Façade	62.0	49.0	35 dB $L_{Aeq,16hour}$	+14.0	Medium
Bedroom Night		51.0	38.0	30 dB $L_{Aeq,8hour}$	+8.0	Medium
Bedroom Night		71.0	58.0	45 dB $L_{Amax,8hour}$	+13.0	Medium
Bedroom / Living Room Day	Rear Green Façade	56.0	43.0	*31 dB $L_{Aeq,16hour}$	+12.0	Medium
Bedroom Night		54.0	41.0	*26 dB $L_{Aeq,8hour}$	+15.0	Medium
Bedroom Night		69.0	56.0	45 dB $L_{Amax,8hour}$	+11.0	Medium

Table 12.0 – Open Window Assessment

*BS4142 Penalty Applied

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- 2) All works have been undertaken in accordance with Infinity Acoustics Ltd's Terms and Conditions. The assessment has been undertaken on behalf of the client based on the Terms and Conditions agreed between the client and Infinity Acoustics Ltd
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