noise.co.uk Ltd
T+44(0)2476 545 397
F+44(0)2476 545 010
The Haybarn
Newnham Grounds
Kings Newnham Lane
Bretford
Warwickshire
CV23 0JU

Environmental Noise Survey

Prepared: 5th November 2025

Report No	23299-1 (R2)
Client	N. Pearson
Site	2493 Ruabon Station Ruabon Wrexham

noise.co.uk

1. Quality Management

Report Number	23299 - 1
Issue	Revision 1[1] | Revision 2[2]
Prepared	5th November 2025
Prepared By	[redacted]
Authorised By	[redacted]

2. Limitations

2.1.1. noise.co.uk Ltd ('Noise') has prepared this report for the sole use of N. Pearson ('Client') in accordance with the Agreement under which our services were performed, proposal reference number 23299. No other warranty, expressed or implied, is made as to the professional advice included in this report or any other services provided by Noise. This report is confidential and may not be disclosed by the Client nor relied upon by any other party without the prior and express written agreement of noise.co.uk Ltd.

2.1.2. The conclusions and recommendations contained in this report are based upon information provided by others and upon the assumption that all relevant information has been provided by those parties from whom it has been requested and that such information is accurate. Information obtained by Noise has not been independently verified by Noise, unless otherwise stated in the report.

2.1.3. The methodology adopted and the sources of information used by Noise in providing its services are outlined in this report. The work described in this report was undertaken between the 3rd October 2025 and 5th November 2025 and is based on the conditions encountered and the information available up to the said date. The scope of this report and the services are accordingly factually limited by these circumstances.

2.1.4. Where assessments of works or costs identified in this report are made, such assessments are based upon the information available at the time and where appropriate are subject to further investigations or information which may become available.

2.1.5. Noise disclaim any undertaking or obligation to advise any person of any change in any matter affecting the report, which may come or be brought to Noise's attention after the date of the report.

2.1.6. Certain statements made in the report that are not historical facts may constitute estimates, projections or other forward looking statements and even though they are based on reasonable assumptions as of the date of the report, such forward-looking statements by their nature involve risks and uncertainties that could cause actual results to differ materially from the results predicted. Noise specifically does not guarantee or warrant any estimate or projections contained in this report.

Copyright: © This report is the copyright of noise.co.uk Ltd.

[1] External Amenity Area Assessment/ Option for secondary glazing to retain existing glazing
[2] Updated Plans and External Amenity Area Assessment: Additional Comments

3. Executive Summary

3.1.1. An environmental noise survey has been carried out for the proposed conversion of offices to a single dwelling at 2493 Ruabon Station, Ruabon, Wrexham ("Proposed Development").

3.2. Measurement, Assessment and Evaluation

3.2.1. The survey was carried out to BS7445-1:2003[3] and BS7445-2:1991[4].

3.3. Scope

3.3.1. This report covers all aspects of the noise survey, including:

- the identification of acoustic design criteria;
- an objective sound pressure level survey of the existing site;
- analysis of the data; and,
- the design of any mitigation to meet the required internal noise criteria.

3.4. Conclusions Summary

TAN11 Assessment

3.4.1. The TAN 11 assessment indicates that daytime noise levels at the Proposed Development generally fall within NEC B and C, while night-time noise levels at Locations 1 and 2 exceed 82 dB L_{AFMAX} several times, placing them in NEC C.

Internal Guideline Noise Assessment

3.4.2. The sound levels have been used to calculate the required facade sound insulation to meet the guideline internal levels from BS8233:2014.

3.4.3. The facade sound insulation required to meet the guideline values from BS8233:2014 are summarised in Table 1. The glazing performance has been specified in terms of the road traffic corrected weighted sound reduction index, $R_w + C_{tr}$, and the ventilator performance has been specified in terms of the road traffic corrected element normalised level difference $D_{ne,w} + C_{tr}$.

Living rooms	Bedrooms
Specification 1 – Facades overlooking rail line	
32 dB $R_w + C_{tr}$ /38 dB $D_{ne,w} + C_{tr}$	38 dB $R_w + C_{tr}$ / 44 dB $D_{ne,w} + C_{tr}$
Specification 2 – Facades facing away from rail line	
24 dB $R_w + C_{tr}$ /30 dB $D_{ne,w} + C_{tr}$	37 dB $R_w + C_{tr}$ / 43 dB $D_{ne,w} + C_{tr}$

Table 1 – Required facade sound insulation (Glazing/Ventilator)

[3] BS7445-1:2003 "Description and measurement of environmental noise – Part 1: Description of quantities and procedures"
[4] BS7445-2:1991 "Description and measurement of environmental noise – Part 2: Guide to the acquisition of data pertinent to land use"

4. Contents

1. Quality Management 2
2. Limitations 2
3. Executive Summary 3
4. Contents 4
5. Background 5
6. Introduction 7
7. Assessment Criteria 9
8. Survey 12
9. TAN11 Assessment 14
10. Mitigation 15
11. Conclusions 18
12. Appendix 19

5. Background

5.1. National Planning Policy Framework

5.1.1. The National Planning Policy Framework (NPPF) was published on the 27th of March 2012 and is regularly updated; it sets out the Government's planning policies for England and how these are expected to be applied. The framework states that the planning system should contribute to and enhance the natural and local environment by:

> *"preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability".*

5.1.2. The NPPF requires that new developments be appropriate to their locations such that the effects of pollution on health have been taken into account. Planning policies and decisions should aim to:

1. avoid noise giving rise to significant adverse impacts on health and the quality of life;
2. mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development; and,
3. identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value.

5.1.3. Existing businesses near to proposed development 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.

5.2. National Planning Practice Guidance

5.2.1. The National Planning Practice Guidance (PPG) is a web-based resource, launched by the Department for Communities and Local Government (DCLG) which was published on the 29th November 2016 and is regularly updated to reflect the changes made to the NPPF and make it more accessible.[5]

[5] http://planningguidance.communities.gov.uk/

5.2.2. There are a number of factors that determine whether a noise could be a concern to a receptor. These include: the absolute level of the noise and when it occurs, whether it is existing or new to the area, temporal characteristics, spectral content and the acoustic absorption in the area.

Perception	Examples of outcomes	Effect level	Action
Not noticeable	No effect	No observed effect	No specific measures required
Noticeable and not intrusive	Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect (NOAEL)	No specific measures required
Lowest Observed Adverse Effect Level (LOAEL)			
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level (SOAEL)			
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, 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.	Significant Observed Adverse Effect	Avoid
Noticeable and very intrusive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

Table 2 – Noise exposure hierarchy

5.2.3. It is emphasised in the PPG that the planning process should be used to mitigate and minimise the impact of noise. This could include: engineering the noise sources to be quiet, minimising the impact of noise through layout, using conditions/obligations to restrict activities, mitigating the impact in places where noise is likely to be experienced (e.g. using facade sound insulation).

6. Introduction

6.1.1. An environmental noise survey has been carried out for the proposed conversion of offices to a single dwelling at 2493 Ruabon Station, Ruabon, Wrexham ("Proposed Development").

6.1.2. An image showing the location of the Proposed Development is given in Figure 2.

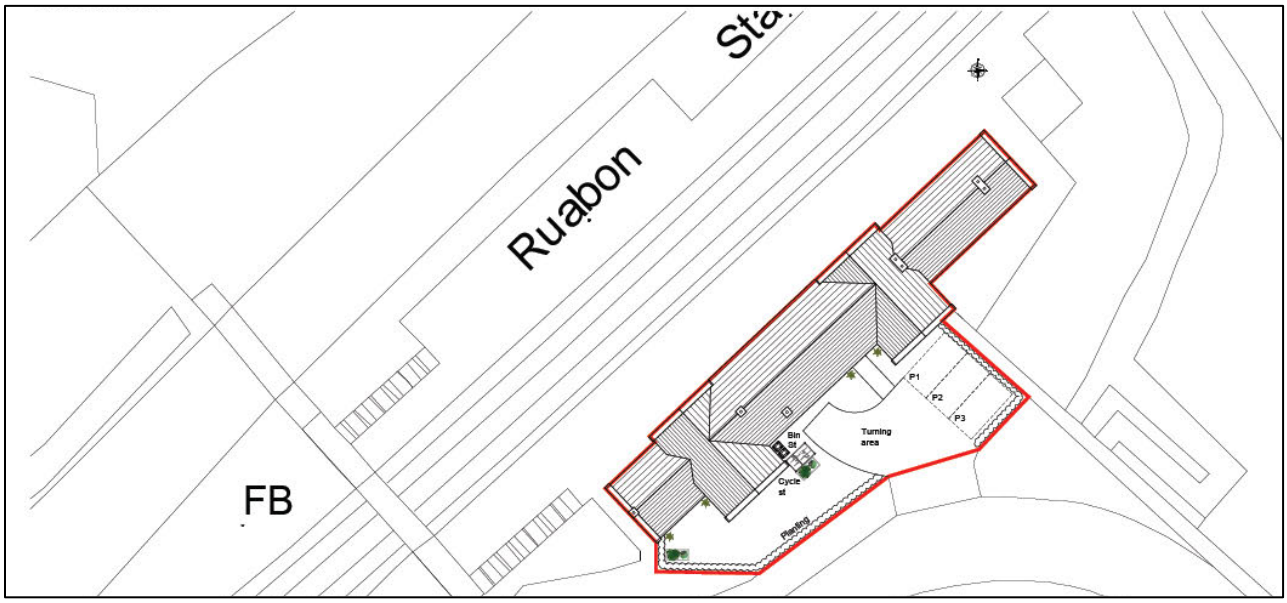


Figure 1 - Plan showing the location of the Proposed Development

6.1.3. Ruabon Railway Station is a combined rail and bus interchange located within the village of Ruabon, Wrexham. It lies on the Shrewsbury to Chester Line, which forms part of the former Great Western Railway mainline route. The station is accessed via Bridge Road, leading onto Station Road. The surrounding area is predominantly residential.

6.1.4. Plans showing the internal layout and elevations of the Proposed Development is given in Figure 2.



Figure 2 – Plans showing the internal layout and elevations

7. Assessment Criteria

7.1. Technical Advice Note (TAN) 11: noise ("TAN11")

7.1.1. The current Welsh government guidance on general noise and planning policy is TAN11. It was produced by the then Department of the Environment (now DEFRA) in October 1997. The document gives general guidance on noise and planning. The main detailed guidance provided in TAN11 is the Noise Exposure Categories for new residential developments.

Noise Exposure Categories (NECs) for residential development

7.1.2. Noise Exposure Categories (NECs) have been derived to assist local planning authorities in their consideration of planning applications for residential development near transport related noise sources. The NECs from appendix A of TAN11 have been reproduce in Table 3 below:

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

Table 3 – NECs reproduced from appendix A of TAN11

7.1.3. TAN11 recommends a range of noise levels for each of the NECs for dwellings exposed to noise from road, rail, air and mixed sources. Where there is a clear need for new residential development in an already noisy area some or all NECs might be increased by up to 3dB above the recommended levels. In other cases, a reduction of up to 3dB may be justified. The recommended noise levels for each NEC from TAN11 have been reproduced in Table 4.

Noise source	Time period, T	Noise Exposure Category (NEC) sound pressure level, dB $L_{Aeq,T}$			
		A	B	C	D
Road	0700-2300	<55	55-63	63-72	>72
	2300-0700*	<45	45-57	57-66	>66
Rail	0700-2300	<55	55-66	66-74	>74
	2300-0700*	<45	45-59	59-66	>66

**Note - Night-time noise levels (2300-0700): sites where individual noise events regularly exceed 82dB LAmax (S time weighting) several times in any hour should be treated as being in NEC C, regardless of the $L_{Aeq,8H}$ (except where the LAeq,8H already puts the site in NEC D).*

Table 4 – Noise exposure categories for road and rail sources from TAN11

7.1.6. The sound pressure levels detailed in Table 4 are free-field; i.e. they refer to sound pressure levels measured on open sites with no nearby buildings or other acoustically reflective surfaces (apart from the ground).

Measures to mitigate the impact of noise

7.1.7. TAN11 recommends several measures to limit exposure to noise, these include:

- Engineering:
  - reduction of noise at point of generation (e.g. using quiet machines and/or quiet methods of working);
  - containment of noise generated (e.g. insulating buildings which house machinery and/or providing purpose-built barriers around sites); protection of surrounding noise-sensitive buildings (e.g. improving sound insulation in these buildings and/or screening them by purpose-built barriers);
- Lay-out:
  - adequate distance between noise source and noise-sensitive building or area;
  - screening by natural barriers, other buildings, or non-critical rooms in a building;
- Administrative:
  - limiting operating time of noise source;
  - restricting activities allowed on the site;
  - specifying an acceptable noise limit.

7.2. BS8233:2014 Internal Ambient Noise Criteria

7.2.1. BS8233:2014 draws on the results of research and experience to provide information on the design of buildings that have internal acoustic environments appropriate to their function. The standard provides guideline internal values for dwellings for steady external noise sources. These have been summarised in Table 5.

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

Table 5 – BS8233:2014 guideline values for internal ambient noise levels from steady external noise sources

7.2.2. The guideline values are issued by the World Health Organisation (WHO) and assume normal diurnal fluctuations in external noise. They are expected to be achieved based on normal annual data and not in all circumstances. For example, it is normal to exclude occasional events such as fireworks night or New Year's Eve.

7.3. Sleep Disturbance and L_{AFMAX}

7.3.1. The WHO give specific guidance on acceptable internal and external LAFMAX levels in residential areas. Table 1 of the WHO Guidelines for Community Noise requires that individual noise events inside dwellings should not regularly exceed 45dB L_{AFMAX}.

7.3.2. BS8233:2014 states that L_{AFMAX} criteria are suitable for regular individual noise events such as scheduled aircraft and passing trains.

BS8233:2014 Garden Criteria

7.3.3. For traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50dB $L_{Aeq,T}$ with an upper guideline value of 55dB $L_{Aeq,T}$ which would be acceptable in noisier environments. However, it is also recognised that these guideline values are not achievable in all circumstances where development might be desirable. In such cases, the lowest practicable levels should be achieved in external amenity areas but the development should not be prohibited.

8. Survey

8.1. Measurement Locations

8.1.1. Fixed position monitoring took place to account for the likely dominant noise sources. The monitoring positions are shown in Figure 3.



Figure 3 - Noise monitoring locations on site

8.1.2. The measurement instrumentation used during the survey is detailed in the appendix. The acoustic equipment was calibrated to comply with Section 4.2 of BS7445-1:2003[6] before and after the surveys. The calibration details are also detailed in the appendix.

8.2. Noise Climate

8.2.1. During the survey visits, the survey technician observed that the noise climate on site was dominated by occasional rail events, with road traffic noise contributing to a lesser extent.

8.3. Meteorology

8.3.1. During the survey the weather information was noted. This is summarised in Table 6.

	3rd October 2025	7th October 2025
Roads(Wet/Dry)	Dry	Dry
Wind Speed (ms^{-1})/Direction	4 / S	4 / S

Table 6 - Meteorological data noted during the survey

[6] BS7445-1:2003 "Description and measurement of environmental noise – Part 1: Guide to quantities and procedures"

8.4. Measurement and Timescale

8.4.1. Unattended noise monitoring was carried out between 3rd October 2025 and 7th October 2025. The measurements that have been made are summarised in Table 7.

Monitoring position	Date	Type	Quantity
1	3rd October 2025 – 7th October 2025	Fixed/unattended	$L_{Aeq,1min}$ | L_{AFMAX}
2	3rd October 2025 – 7th October 2025	Fixed/unattended	$L_{Aeq,1min}$ | L_{AFMAX}
3	3rd October 2025 – 7th October 2025	Fixed/unattended	$L_{Aeq,1min}$ | L_{AFMAX}

Table 7 – Measurements made at the site of the Proposed Development

8.4.2. Sound pressure measurements were subsequently averaged into hourly, daytime and night-time periods. The acoustic measurements and their interpretation have been in accordance with BS 7445: Parts 1, and 2[7]. All sound pressure levels are in dB (re 20μPa).

8.5. Results Summary

8.5.1. The worst-case average daytime and night-time exposure levels measured during the survey are summarised in Table 8. The 10th highest L_{AFmax} sound pressure level attributed to passing trains has been reported in accordance with WHO guidance. It should be noted that the values have a -3dB façade correction applied.

Measurement location	Daytime dB, $L_{Aeq,16hr}$	Night-time dB, $L_{Aeq,8hr}$	Night-time dB, L_{AFMAX}
1	58.4	52.0	81.1
2	66.6	62.3	82.5
3	57.4	53.6	72.8

Table 8 - Summary of the external sound pressure levels measured

8.5.2. It should be noted that the sound pressure levels represent the absolute levels, i.e., including all other residual noise sources such as platform operations, for example, public address announcements.

[7] BS7445-2:1991 "Description and measurement of environmental noise – Part 2: Guide to the acquisition of data pertinent to land use"

9. TAN11 Assessment

9.1.1. The worst-case daytime and night-time exposure levels have been assessed against TAN11 and are summarised in Table 9.

Measurement Location	Daytime $L_{Aeq,16hr}$	NEC (Day)	Night-time $L_{Aeq,8hr}$	NEC (Night)	Night-time L_{AFMAX}
1	58.4	B	52.0	B	Night-time L_{AFMAX} exceeds 82 dB several times → NEC C
2	66.6	C	62.3	C	Night-time L_{AFMAX} exceeds 82 dB several times → NEC C
3	57.4	B	53.6	B	L_{AFMAX} <82 dB → NEC remains B

Table 9 - TAN11 Noise Assessment

9.1.2. The TAN 11 assessment indicates that daytime noise levels at the Proposed Development generally fall within NEC B and C, while night-time noise levels at Locations 1 and 2 exceed 82 dB L_{AFMAX} several times, placing them in NEC C.

9.1.3. Following the TAN 11 assessment, noise mitigation has been specified based on the worst-case average daytime sound pressure levels and night-time L_{AFmax} values measured at Positions 1 and 2, in order to achieve the "Good" internal noise criteria for living rooms and bedrooms, as set out in BS 8233:2014.

10. Mitigation

10.1. Methodology

10.1.1. Based on the measured free-field sound pressure levels at the worst affected facades the simple calculation method from BS8233:2014 has been used to determine the necessary sound reduction to meet the guideline values. Standard forms of construction are assumed such that the glazing is likely to be the lowest performing facade element.

10.2. Required Mitigation

10.2.1. The single figure glazing and ventilator performance requirements in order to achieve the internal design criteria are summarised in Table 10. The glazing performance has been specified in terms of the road traffic corrected weighted sound reduction index, $R_w + C_{tr}$, and the ventilator performance has been specified in terms of the road traffic corrected element normalised level difference $D_{ne,w} + C_{tr}$.

Living rooms	Bedrooms
Specification 1 – Facades overlooking rail line	
32 dB $R_w + C_{tr}$ /38 dB $D_{ne,w} + C_{tr}$	38 dB $R_w + C_{tr}$ / 44 dB $D_{ne,w} + C_{tr}$
Specification 2 – Facades facing away from rail line	
24 dB $R_w + C_{tr}$ /30 dB $D_{ne,w} + C_{tr}$	37 dB $R_w + C_{tr}$ / 43 dB $D_{ne,w} + C_{tr}$

Table 10 – Required facade sound insulation (Glazing/Ventilator)

10.2.2. A plan showing where these specifications apply has been provided in the appendix.

10.3. Glazing and Ventilator Specifications

10.3.1. The glazing and ventilator performance has been specified based on the performance data provided by Saint-Gobain, Selectaglaze and Greenwood Airvac. These are suggested configurations and any other glazing can be used provided it achieves the minimum performance levels given in Table 10. The recommended glazing specifications are given in Table 11.

Living rooms	Bedrooms
Specification 1 – Facades overlooking rail line	
Saint Gobain 4 (6) 10	Saint Gobain 10 (12) 8.8A
Specification 2 – Facades facing away from rail line	
Saint Gobain 4 (12) 4	Saint Gobain 10 (12) 8.8A

Table 11 – Our recommended glazing configurations

10.3.2. Should penetrations be required for ventilation purposes, the $D_{ne,w} + C_{tr}$ provided by the total combination of ventilators should equal or exceed the values given in Table 10. It should be noted that the $D_{ne,w} + C_{tr}$ of a ventilator is based on a single ventilator and if more than one ventilator is included in each habitable room a higher individual $D_{ne,w} + C_{tr}$ will be required.

10.3.3. Our recommended ventilator configurations, calculated to work in conjunction with the glazing specifications, are summarised in Table 12. It should be checked by a suitably qualified person that this ventilator specification meets the requirements of Approved Document F.

Living rooms	Bedrooms
Specification 1 – Facades overlooking rail line	
1 x Greenwood Vent (5000EA) + 2 Acoustic Set	1 x Greenwood MA3051 (2500EA) Acoustic Wall Ventilator
Specification 2 – Facades facing away from rail line	
1 x Greenwood Vent (5000EA)	1 x Greenwood MA3051 (2500EA) Acoustic Wall Ventilator

Table 12 - Our recommended ventilator configurations

10.3.4. The client has highlighted that the building is Grade II listed, and therefore the existing glazing may need to be retained. In this case, an alternative option is to install secondary glazing. For example, a Selectaglaze system comprising 6 mm primary float glass with a mastic seal, a 100 mm cavity, and an S10 4 mm secondary pane is capable of achieving 39 dB $R_w + C_{tr}$[8].

10.3.5. Given the assumptions in this method the information in this section should be treated as general guidance only. The acoustic performance of third party products cannot be guaranteed by noise.co.uk.

[8] Sound Insulation Measurements of Secondary Glazing Systems for Selectaglaze Ltd - Test Report No, 8049

10.4. External Amenity Area Noise Assessment

10.4.1. BS8223 states that it is ***desirable*** that the external noise level for amenity spaces, such as gardens and patios, does not exceed 50dB $L_{Aeq,T}$ with an upper guideline value of 55dB $L_{Aeq,T}$ which would be acceptable in noisier environments.

10.4.2. However, the standard acknowledges that there may be areas where development is desirable where these guideline values are not achievable. This will be true for higher noise areas such as city centres or urban areas adjoining the strategic transport network. In these situations, a compromise between elevated noise levels and other factors might be warranted, such as:

- the convenience of living in these locations; and/or,
- making efficient use of land resources to ensure development needs can be met.

10.4.3. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces but should not be prohibited.

10.4.4. In this case, the garden area is screened by its associated building from the railway line, which is expected to provide more effective noise attenuation than a standalone noise barrier.

10.4.5. Daytime sound pressure levels at the rear of the property ranged from 57.4 to 58.4 dB $L_{Aeq,T}$, slightly exceeding the upper guideline value by 2–3 dB.

10.4.6. However, changes below 3 dB are generally not perceptible under laboratory conditions. In this case, sound pressure levels between 55 dB $L_{Aeq,T}$ and 58 dB $L_{Aeq,T}$ would not be expected to be noticeably different in day-to day-life.

10.4.7. Furthermore, there are existing dwellings with gardens oriented either side-on or directly facing the railway line, rather than being screened behind their associated buildings. These properties are therefore likely to experience similar, or in some cases higher, external sound pressure levels within their garden areas compared to those proposed.

10.4.8. As a result, additional noise mitigation measures are not considered necessary.

11. Conclusions

11.1.1. An environmental noise survey has been carried out at the site of a proposed residential development at 2493 Ruabon Station, Ruabon, Wrexham to determine typical ambient sound levels.

TAN11 Assessment

11.1.2. The TAN 11 assessment indicates that daytime noise levels at the Proposed Development generally fall within NEC B and C, while night-time noise levels at Locations 1 and 2 exceed 82 dB L_{AFMAX} several times, placing them in NEC C.

Internal Guideline Noise Assessment

11.1.3. The sound levels have been used to calculate the required facade sound insulation to meet the guideline internal levels from BS8233:2014. Table 10 in section 10 gives the required facade sound reduction by any glazing and ventilator combination to be compliant with the guideline values.

12. Appendix

APPENDIX A: Summary Information

Required ISO Test Report Information (cross referenced where required)			
		Measurements carried out to:	Analysed to:
A	Standards	BS 7445-1: 2003 BS 7445-2: 1991	TAN11 BS 8233:2014
B	Organisation performed the measurements	noise.co.uk Ltd, The Haybarn, Newnham Grounds, Kings Newnham Lane, Bretford, Coventry, CV23 0JU.	
C	Name of Client	N. Pearson	
D	Full site address	2493 Ruabon Station Ruabon Wrexham	
E	Date of surveys	Survey Date: 3rd October 2025 – 7th October 2025	
F	Description & identification of Proposed Development	It is proposed to develop the site for residential use.	
G	Brief Description of details of Procedure & equipment	See Section 5 of this report.	

APPENDIX B: Technical Appendix

12.1.1. Measurements were made using the following equipment:

Monitoring Position	Sound Level Meter (Serial Number)	Calibrator (Serial Number)
1	SoftdB Piccolo 2 (PO221070105)	BSWA CA114 (590010)
2	SoftdB Piccolo 2 (PO221070104)	BSWA CA114 (590010)
3	SoftdB Piccolo 2 (PO221070106)	BSWA CA114 (590010)

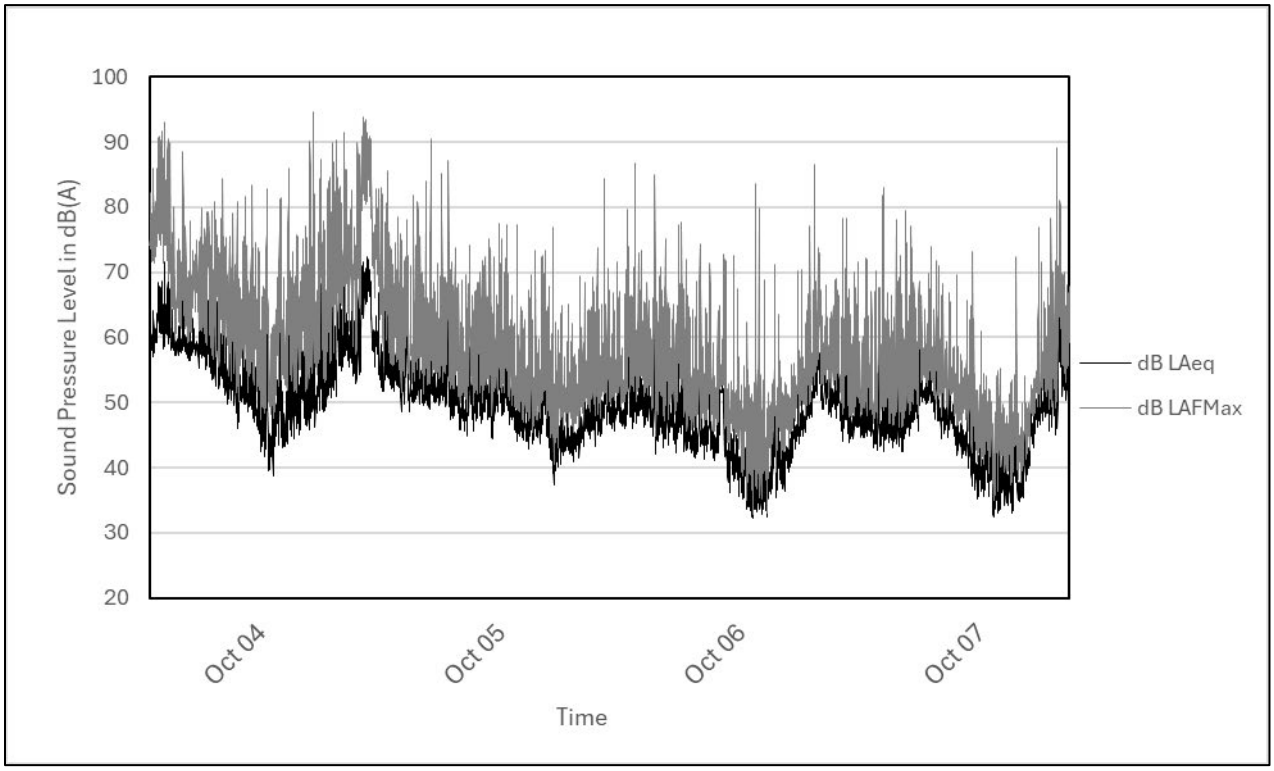
12.1.2. The equipment has traceable calibration. The sound level meter was calibrated immediately prior to and immediately after the measurements were carried out.

Sound Level Meter	Before	After
SoftdB Piccolo 2 (PO221070105)	94.0 dB	94.0 dB
SoftdB Piccolo 2 (PO221070104)	94.0 dB	94.0 dB
SoftdB Piccolo 2 (PO221070106)	94.0 dB	94.0 dB

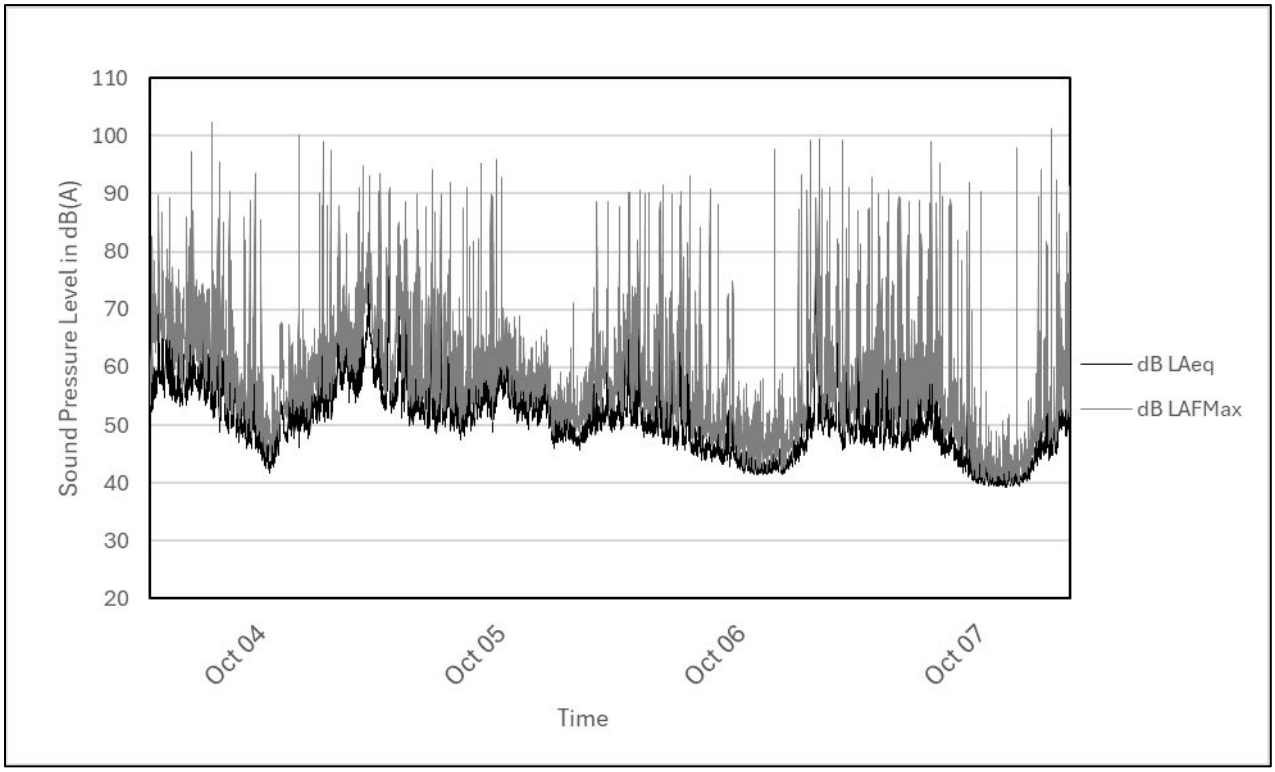
12.1.3. There was no adverse deviation.

APPENDIX C: Raw Data (Note - Values do not have a -3dB façade correction applied)

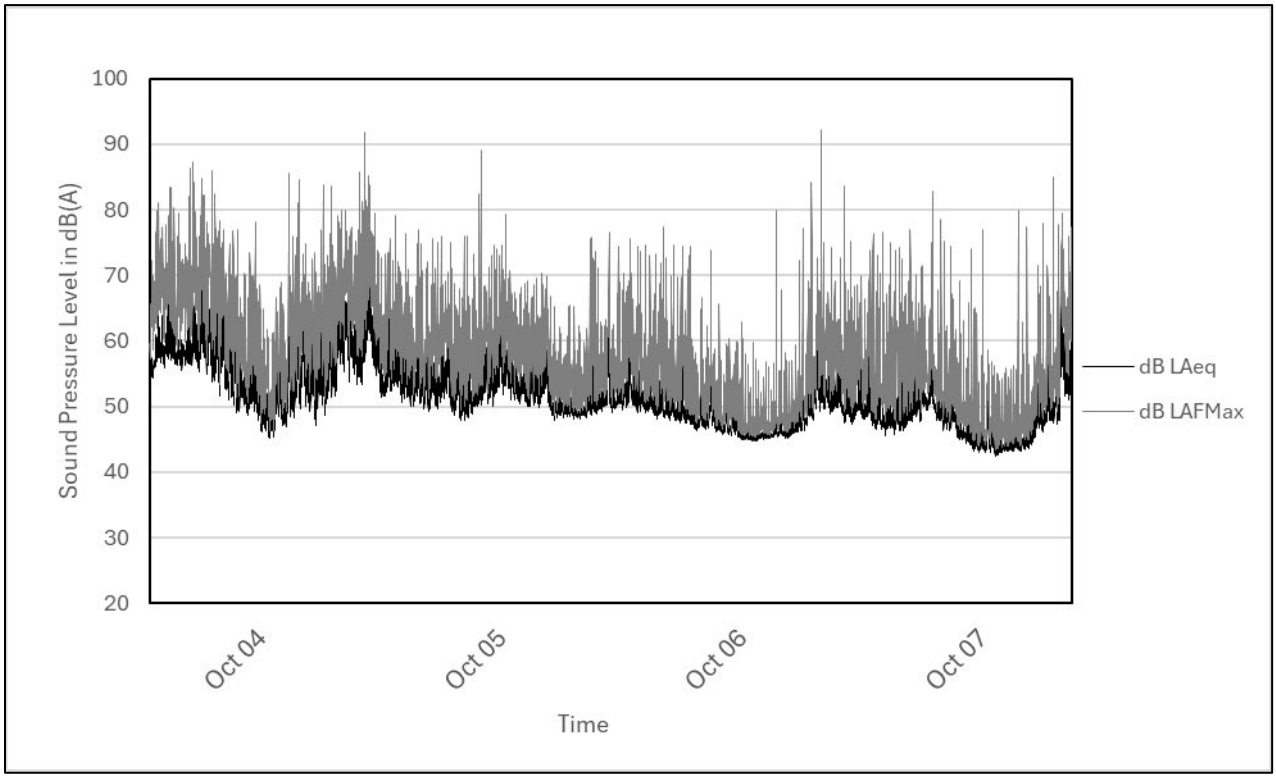
Position 1



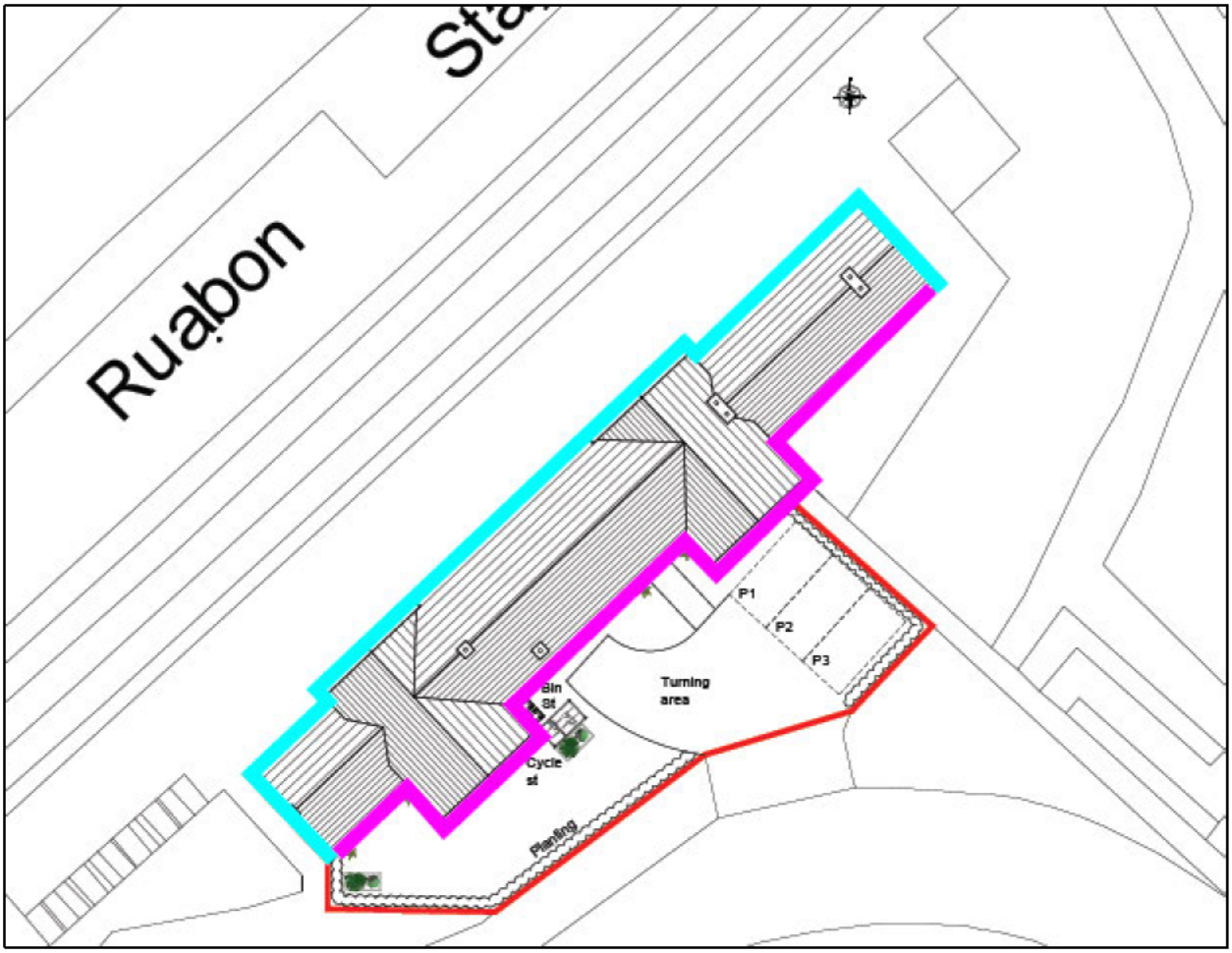
Position 2


110
100
90
80
70
60
50
40
30
20
Sound Pressure Level in dB(A)
Oct 04
Oct 05
Oct 06
Oct 07
Time
dB LAeq
dB LAFMax

Position 3

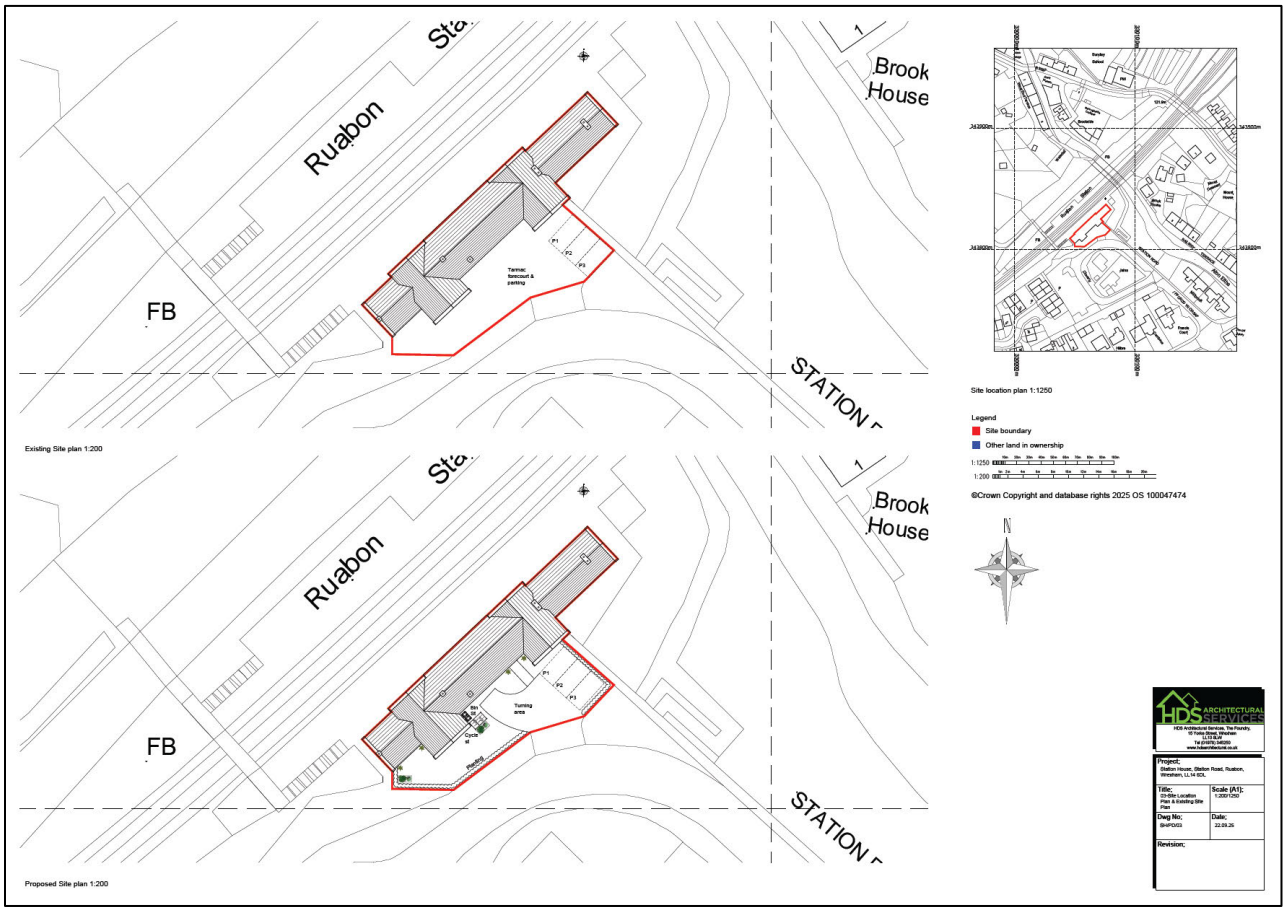

100
90
80
70
60
50
40
30
20
Sound Pressure Level in dB(A)
Oct 04
Oct 05
Oct 06
Oct 07
Time
dB LAeq
dB LAFMax

APPENDIX D: Glazing Markup Plan



Living rooms	Bedrooms
Specification 1 – Facades overlooking rail line	
32 dB $R_w + C_{tr}$ /38 dB $D_{ne,w} + C_{tr}$	38 dB $R_w + C_{tr}$ / 44 dB $D_{ne,w} + C_{tr}$
Specification 2 – Facades facing away from rail line	
24 dB $R_w + C_{tr}$ /30 dB $D_{ne,w} + C_{tr}$	37 dB $R_w + C_{tr}$ / 43 dB $D_{ne,w} + C_{tr}$

APPENDIX E: Client Information




N
Utility
Dining
Kitchen
ST
E/S
Bathroom
Corridor
Bedroom-03
Hall
Living
Corridor
Bedroom-02
Bedroom-01
Dressing
E/S
T
Level
Ground floor plan 1:50
Front Elevation 1:100
Side-01 Elevation 1:100
Rear Elevation 1:100
Side-01 Elevation 1:100
Proposed
HDS ARCHITECTURAL SERVICES