



Calbron House Unit 7 Rushmere Close West Mersea Colchester Essex CO5 8QQ
Tel: (01206) 386800 E-Mail: info@dbc-ltd.co.uk



Technical Report:

Environmental Noise and
Vibration Assessment
for a block of 14 flats at 67-77
High Street, Northfleet,
Gravesend, Kent
DA11 9HJ

Project Ref: 11082

Environmental Noise and Vibration Assessment

Date of Issue:	8 th August 2025
Compiled by:	Sam Riley BA/BSc, DipIOA, MIOA
Copies to:	Liridon Logu J B Property Limited
Signed by:	 Sam Riley dB Consultation
Countersigned by:	 Mick Lane dB Consultation



DISCLAIMER

dBc has used reasonable skill and care in completing this work and preparing this report, within the terms of its brief and contract and taking account of the resources devoted to it by agreement with the client. We disclaim any responsibility to the client and others in respect of any matters outside the stated scope. This report is confidential to the client and we accept no responsibility to third parties to whom this report, or any part thereof, is made known. The opinions and interpretations presented in this report represent our reasonable technical interpretation of the data made available to us including type of plant and machinery, client data, manufacturer's data, operating times and location. dBc accepts no responsibility for data provided by other bodies and no legal liability arising from the use by other persons of data or opinions in this report.

Except for the provision of professional services on a fee basis, dBc does not have a commercial arrangement with any other person or company involved in the interests that are the subject of this report.

The material presented in this report is confidential. This report has been prepared for the exclusive use of the client. dBc hereby grant to the Addressee, upon payment of dBc fees for the work undertaken, with immediate effect, an irrevocable, non-exclusive, non-terminable, royalty-free licence to use and reproduce for any purpose relating to the site, property or project all documents, reports, drawings, calculations and specifications (and the designs contained in them) which have been prepared by dBc or on our behalf in connection with the site, property or project, and dBc agree to supply to the Addressee upon request copies of such materials (subject to reimbursement of our reasonable copying charges).



Contents

1.	Executive Summary	4
2.	Recommendations.....	5
3.	Introduction.....	6
4.	Standards / References / Assessment Criteria	7
5.	Site Description	11
6.	Environmental Measurements.....	15
7.	Noise Assessment.....	18
8.	Acoustic Design Statement.....	20
9.	Vibration Monitoring.....	22
10.	Vibration Assessment.....	23
11.	Glossary of Acoustic Terminology	24

Rev 1	Draft for approval	08/08/25



1. Executive Summary

- 1.1. dB Consultation Limited (dBc) were commissioned by J B Property Ltd. to provide environmental noise and vibration assessments for the demolition of a tyre garage and car wash and erection of a 14 flat residential block at 67-77 High Street, Northfleet, Gravesend, Kent DA11 9HJ.
- 1.2. dBc undertook environmental noise monitoring at location P1 and vibration monitoring at V1 between 16th and 21st July 2025 which included a weekend.
- 1.3. The average external noise levels affecting the northern façade of the proposed flats were $L_{Aeq,16h}$ 66dB during the day and $L_{Aeq,8h}$ 61dB at night. At these ambient noise levels, the development will require good acoustic design to ensure adequate living conditions for future occupiers of the flats.
- 1.4. Maximum noise levels affecting the front façade of the development were assessed at L_{max} 77dB(A)
- 1.5. Mitigation measures are required for the front façade affected by road traffic noise, in the form of enhance double glazing and 3 sided 1.5m high balcony screens, to ensure adequate living conditions for occupiers of the flats.
- 1.6. The Noise Policy Statement for England (NSPE) outlines three aims for effective management and control of environmental, neighbourhood and neighbour noise:
 - *Avoid significant adverse impacts on health and quality of life;*
 - *Mitigate and minimize adverse impacts on health and quality of life; and*
 - *Where possible, contribute to the improvement of health & quality of life.*
- 1.7. The proposed recommendations within Section 2 of this report should address these aims by effectively reducing ambient noise levels from road traffic in the flats adjacent to the High Street to $L_{Aeq,16h}$ 29dB during the day and $L_{Aeq,8h}$ 25dB at night at P1, below the desirable level for the internal ambient noise levels as detailed in BS 8233:2014 and reducing the maximum levels such that they do not normally exceed 45dB $L_{Amax,F}$ more than 10 times a night.
- 1.8. The vibration dose values were below the low probability for adverse comment; no vibration mitigation measures are required.



2. Recommendations

External Noise

- 2.1. The following **glazing and trickle ventilation** specifications should be installed at the development as a minimum.

Element	R_w	Sound Reduction Index, R 1/1 octave band centre frequency between 31.5Hz and 4kHz						
		63	125	250	500	1k	2k	4k
Front Façade: 6mm /16mmArgon /8.8mm Pilkington Optiphon	41	20	25	27	38	48	47	55
Rear and side Façade: 4mmglass/12mmAir/4mmglass	30	13	23	18	26	38	44	38
	$D_{n,e,w}$	Normalized Level Difference $D_{n,e}$						
Rear Façade: Greenwood 5000EAW.AC2 ventilation	42	33	42	40	36	48	53	56

Table 1: Sound Reduction Indices, R in dB and normalised level difference in dB

- 2.2. Other glazing can be used if the specification used is equivalent to the glazing sound reduction shown in Table 1.
- 2.3. Acoustic vents and in-wall ventilators can form part of the building design on the **rear façade**, and all windows can remain openable.
- 2.4. The assessment of the front façade relied on windows closed with no trickle vents; an alternative ventilation strategy (supplied by others) is required for these living/kitchen/dining rooms and bedrooms.
- 2.5. To screen road traffic noise from the front façade bedrooms, the balconies on the first and second should be partially enclosed by 3 sided 1.5m high solid glass or similar screens as shown in yellow in Fig. 1 below.



Fig. 1: Position of the 3 sided 1.5m high glass or equivalent solid balcony screens – drawing 1586-06

3. Introduction

- 3.1. J B Property Limited have requested an environmental noise and vibration assessments to accompany a planning application for the erection of a 14 flat residential block with ground floor car parking at 67 – 77 High Street, Northfleet.
- 3.2. The purpose of this report **dBc/Northfleet/11082/SR/01** is to ensure good living conditions from road traffic noise for any future occupiers of the flat.
- 3.3. The report will encompass acoustic and vibration surveys and undertake assessments using methodology and guidance of BS 8233:2014 and BS 6472-1:2008.
- 3.4. The report was written by Samantha Riley, Acoustic Consultant of dB Consultation Limited (dBc), a practicing acoustician for over 24 years, Full Member of the Institute of Acoustics (MIOA) and experienced in noise assessment in many industrial and commercial sectors.
- 3.5. The report has been reviewed by Mick Lane, Acoustic Director at dB Consultation Limited, a practicing acoustician for over 20 years, Full Member of the Institute of Acoustics (MIOA) and experienced in noise assessment in many industrial and commercial sectors.



4. Standards / References / Assessment Criteria

Noise Policy Statement for England (NPSE) March 2010

- 4.1. The NPSE sets out the long-term vision of the Government's policy on noise, which in essence is to promote good health and a good quality of life through the effective management of noise within the context of Government Policy on sustainable development.
- 4.2. The NPSE outlines three aims for effective management and control of environmental, neighbourhood and neighbour noise:
- *Avoid significant adverse impacts on health and quality of life;*
 - *Mitigate and minimize adverse impacts on health and quality of life; and*
 - *Where possible, contribute to the improvement of health & quality of life.*
- 4.3. In its aims, the NPSE uses key phrases "significant adverse" and "adverse" and these are related to the following terms which are currently being applied to noise impacts.;
- *NOEL – No Observed Effect Level – this is the level below which no effect can be detected or measured,*
 - *LOAEL – Lowest Observed Adverse Effect Level – which is the level above which adverse effects on health and quality of life can be detected; and*
 - *SOAEL – Significant Observed Adverse Effect Level – which is the level above which significant adverse effects on health and quality of life occur.*
- 4.4. The NPSE notes that it is not possible to have a single objective noise-based measure that defines SOAEL that would be applicable in all situations, consequently the NOEL, LOAEL and SOAEL are likely to change for the location, noise type and times. It is the acoustician who should identify relevant SOAEL levels taking into account the noise source exposures and receptors.



BS 8233:2014 Sound Insulation and Noise Reduction for Buildings

- 4.5. This standard uses the results of research and experience to provide information on the design of buildings to result in suitable internal acoustic environments appropriate for their functions. It includes controlling the noise from outside the building, noise from plant and services within it and room acoustics for non-critical situations.
- 4.6. The main changes in this latest version of BS 8233 were made to include revisions to Building Regulations Approved Doc E, the publication of the National Planning Policy Framework in 2012 removal of documents such as PPG24, and most importantly a reappraisal of the targets for various classes of living spaces following various research findings.
- 4.7. Section 5.2 states that ‘when planning permission is sought for a new building or a change of use to an existing building, the local authority may grant permission, with or without conditions regarding noise levels so that local or national policies are met’.
- 4.8. Section 7.7.2 provides a desirable level for the internal ambient noise levels for dwellings which have been included in the table below.

Activity	Location	Time Period	
		07:00 to 23:00	23:00 to 07:00
Resting	Living Room	35dB $L_{Aeq,16h}$	-
Dining	Dining Room/Area	40dB $L_{Aeq,16h}$	-
Sleeping	Bedroom	35dB $L_{Aeq,16h}$	30dB $L_{Aeq,8h}$

Table 2: Excerpt of BS 8233:2014 Table 4 – Indoor Ambient Noise Levels for Dwellings.

- 4.9. Note 5 of this section states that ‘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’. If applicable, any room should have adequate ventilation (e.g. trickle ventilators should be open) during assessment’.
- 4.10. Note 7 of this section states that ‘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.

Design criteria for external noise

- 4.11. 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 50 dB $LA_{eq,T}$, with an upper guideline value of 55 dB $LA_{eq,T}$ which would be acceptable in noisier environments. However, it is also recognized that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land



resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces but should not be prohibited.

Pro PPG Planning And Noise May 2017

- 4.12. Note 3 Page 13 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'*.

Building Regulations 2010 Approved Document O

Noise

- 3.2** In locations where external noise may be an issue (for example, where the local planning authority considered external noise to be an issue at the planning stage), the overheating mitigation strategy should take account of the likelihood that windows will be closed during sleeping hours (11pm to 7am).
- 3.3** Windows are likely to be closed during sleeping hours if noise within bedrooms exceeds the following limits.

- 40dB $L_{Aeq,T}$ averaged over 8 hours (between 11pm and 7am).
- 55dB L_{AFmax} more than 10 times a night (between 11pm and 7am).

- 3.4** Where in-situ noise measurements are used as evidence that these limits are not exceeded, measurements should be taken in accordance with the Association of Noise Consultants' *Measurement of Sound Levels in Buildings* with the overheating mitigation strategy in use.

NOTE: Guidance on reducing the passage of external noise into buildings can be found in the *National Model Design Code: Part 2 – Guidance Notes* (MHCLG, 2021) and the Association of Noise Consultants' *Acoustics, Ventilation and Overheating: Residential Design Guide* (2020).



BS 6472-1:2008 Guide to evaluation of human exposure to vibration in buildings Part 1: Vibration sources other than blasting

- 4.13. Section 6 of this standard is for the assessment of building vibration with respect to human response.
- 4.14. When the appropriately-weighted vibration measurements or predictions have been used to derive the VDV for either 16 h (daytime) or 8 h (night-time) at the relevant places of interest, their significance in terms of human response for people in those places can be derived from table 1. The judgement made is of the probability that the determined vibration dose might result in adverse comment by those who experience it.

Table 1 Vibration dose value ranges which might result in various probabilities of adverse comment within residential buildings			
Place and time	Low probability of adverse comment $\text{m}\cdot\text{s}^{-1.75}$ 1)	Adverse comment possible $\text{m}\cdot\text{s}^{-1.75}$	Adverse comment probable $\text{m}\cdot\text{s}^{-1.75}$ 2)
Residential buildings 16 h day	0.2 to 0.4	0.4 to 0.8	0.8 to 1.6
Residential buildings 8 h night	0.1 to 0.2	0.2 to 0.4	0.4 to 0.8



5. Site Description

- 5.1. The site is currently a tyre garage and hand car wash which operate between 08:00 and 18:00 Monday to Saturday and 08:00 and 17:00 Sunday. The proposed development is to demolish the tyre garage and hand car wash and erect a detached four storey block of 14 flats with parking at 67 – 77 High Street, Northfleet, Gravesend, Kent DA11 9HJ.
- 5.2. The area is a mixture of commercial and residential properties fronting the High Street, a busy 30mph road. The High Street provides links to the nearby commercial and industrial estates and the docks to the north. There is a haulage road and tunnel approximately 25m to the west which is under the Hot Rod Diner and railway lines over 200m to the southwest. The site location, outlined in red and environmental monitoring position P1 and vibration monitoring position V1 are marked on Fig. 2 below.



Fig. 2: Site location and monitoring position P1 and V1

5.3. The proposed layouts for the building, assessed bedrooms shaded blue and assessed living/dining/kitchens are shaded green are shown in Figs. 3 to 6.

5.4. Units 1 and 2 are located at the rear of the car park setback 9m from the pavement, there is no screening from the High Street.

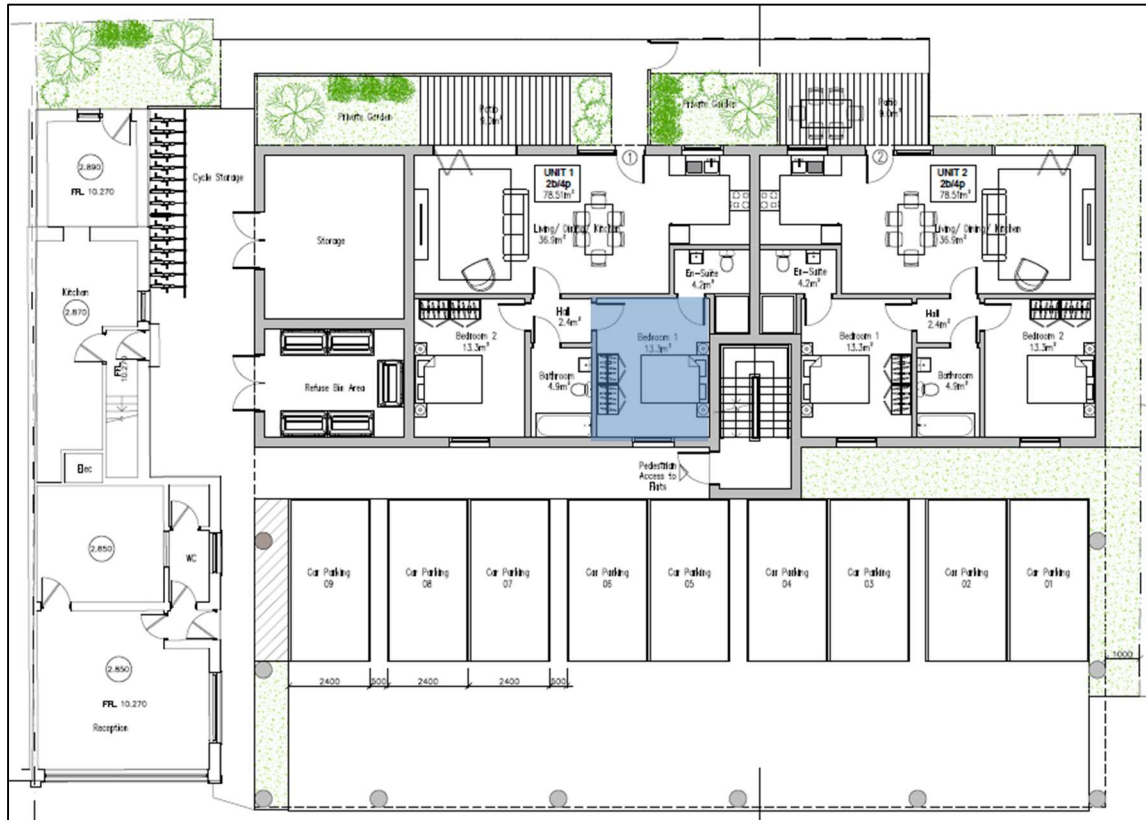


Fig. 3: Ground floor proposed layout, assessed bedroom, shaded blue - drawing 1586-04

5.5. The layout for the first and second floors are the same, the first-floor rooms have been assessed.



Fig. 4: First floor proposed layout, assessed bedrooms shaded blue and L/D/K shaded green – drawing 1586-04

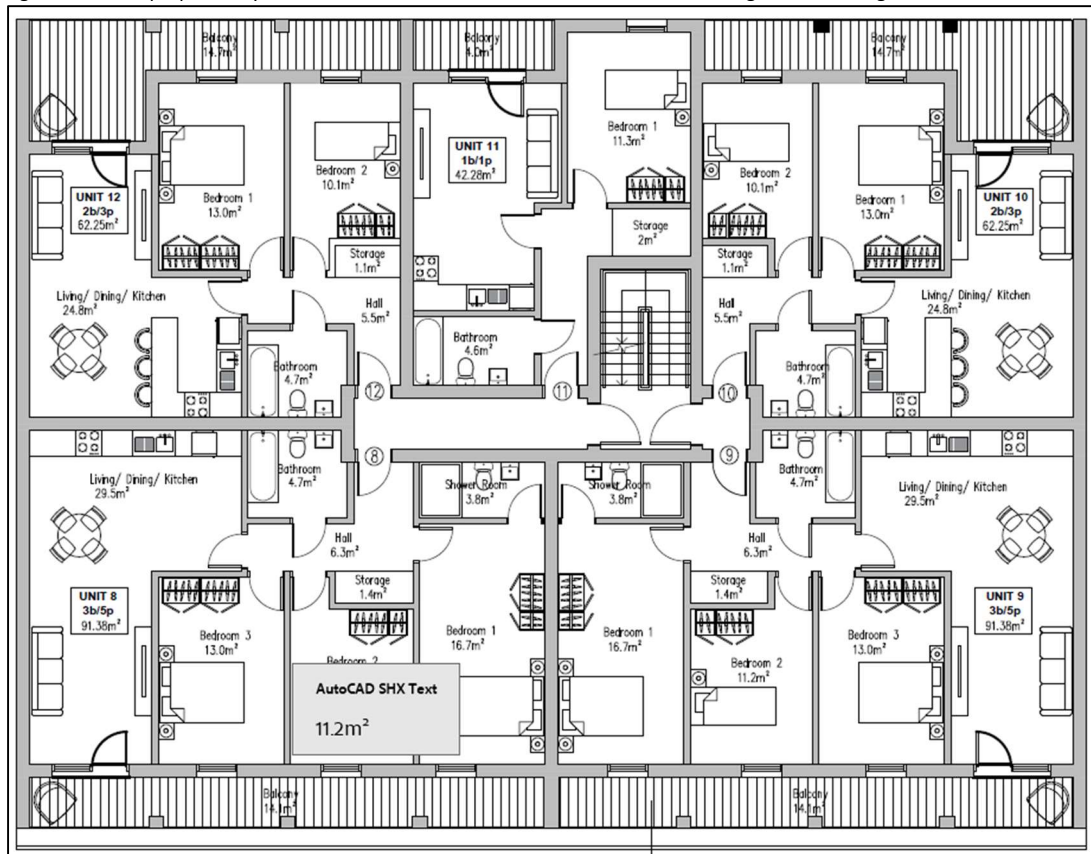
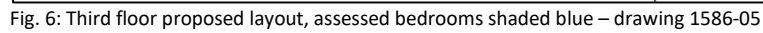


Fig.5: Second floor proposed layout – drawing 1586-05



Page 14

6. Environmental Measurements

- 6.1. The noise affecting 67 – 77 High Street is currently from the tyre garage, hand car wash, road traffic, aeroplanes, trains, footfall and conversation; the proposed development will not have tyre garage and hand car wash activity noise. Environmental noise was measured at the front of the site on the boundary with the High Street, P1 shown in Table 3, between the 16th and 21st July 2025.
- 6.2. The monitoring at P1, described in Table 3 below, was undertaken using a Norsonic 140 sound level meter serial number 1407786 which was field calibrated to 114dB at 1kHz using a Nor-1255 calibrator serial number 25754. Both the meter and calibrator have been calibrated at a UKAS accredited laboratory within the last two years. Calibration certificates are available upon request. The field calibration reading was within standard guidance allowance.

Location	Photo	Noise Sources
P1 Situated on the site boundary with the High Street, 2.5m high		Tyre garage, hand car wash, road traffic, aeroplanes, trains, footfall, conversation

Table 3: Environmental Monitoring Location P1.

6.3. The weather during the monitoring period is summarised in Table 4 below.

Date	Time	Details	Temp (°C)	Wind Speed (m/s)	Wind Direction
16 th July	07:00 – 23:00	Sunny intervals, dry	16 – 25	2.2 – 5.8	W/NW/NE
16 th /17 th July	23:00 – 07:00	Clear skies, dry	15 – 20	0.9 – 1.3	E/SE
17 th July	07:00 – 23:00	Sunny intervals, light rain	17 – 26	0.9 – 3.1	S/SW
17 th /18 th July	23:00 – 07:00	Clear skies, dry	17 – 22	1.8 – 2.2	SW
18 th July	07:00 – 23:00	Sunny intervals, dry	18 – 27	1.8 – 4.5	S
18 th /19 th July	23:00 – 07:00	Overcast, showers	17 – 20	1.3 – 2.2	SE
19 th July	07:00 – 23:00	Thunder showers	19 – 24	1.8 – 4.5	S
19 th /20 th July	23:00 – 07:00	Patchy cloud, showers	16 – 18	2.7 – 3.1	SW
20 th July	07:00 – 23:00	Overcast, light rain	17 – 22	3.1 – 5.8	SW
20 th /21 st July	23:00 – 07:00	Clear skies, patchy cloud	15 – 17	2.2 – 2.7	SW
21 st July	07:00 – 23:00	Showers, sunny intervals	16 – 23	2.7 – 4.9	W

Table 4: Weather during the monitoring period.

- 6.4. There were periods during the monitoring when the weather was less favourable for monitoring i.e. wind speeds exceeded 5m/s or rain showers, the data during these times was examined and there was no noticeable impact on the noise levels.
- 6.5. There was tyre garage and hand car wash activity noise onsite between the hours of 08:00 and 18:00 Monday to Saturday and 08:00 and 17:00 on Sunday, to obtain representative daytime levels for the new development environmental noise levels between 07:00 and 08:00 and 18:00 and 21:00 were used to assess daytime impact from the dominant noise source of road traffic noise. Examining the data the noise levels during these periods were consistent, however after 21:00 the noise levels reduced when road traffic levels are likely to be less and not representative of daytime road traffic activity. The assessment of daytime noise has been deemed equivalent to a 16Hr average for this assessment.
- 6.6. The daytime $L_{Aeq,16hr}$ and night-time $L_{Aeq,8hr}$ ambient noise levels measured at P1 are shown below.

Measurement Location	Date	Daytime 07:00 – 23:00 $L_{Aeq,16hr}$ in dB	Date	Night-time 23:00 – 07:00 $L_{Aeq,8hr}$ in dB
P1	16 th July	64	16 th /17 th July	60
	17 th July	65	17 th /18 th July	60
	18 th July	66	18 th /19 th July	60
	19 th July	65	19 th /20 th July	58
	20 th July	63	20 th /21 st July	64
	21 st July	69		
	Log Average	66	Log Average	61

Table 5: Day and night-time ambient noise levels at P1 in dB.

6.7. The average overall and 1/1 octave band frequency noise levels between 63Hz and 4 kHz to be used in the assessment are shown in Table 6 below.

Location	dBA	1/1 octave band centre frequencies in Hz						
		63	125	250	500	1k	2k	4k
P1 Day	66	63	62	60	59	62	60	56
P1 Night	61	60	57	55	54	56	54	51

Table 6: 1/1 Octave Band Data at P1 in dB.

6.8. Table 7 shows the overall $L_{\max}$ and 1/1 octave band data to be used for the assessment, corrected for distance from the balcony façade to the windows and screening.

	dBA	63	125	250	500	1k	2k	4k
Night	77	82	75	71	66	66	65	6

Table 7: Spectral breakdown of the $L_{\max}$ assessment levels in dB



7. Noise Assessment

Internal Ambient Noise Levels

- 7.1. The internal noise levels have been determined for the first-floor unit 3 living/kitchen/dining room and bedroom 1, shaded blue in Fig.3 above with **windows closed, no trickle vents**. The internal noise levels have been determined for all the rooms shaded in Figs. 3 – 6, the unit 3 assessment was representative for all habitable room façades facing the High Street. The third floor does not have balconies but is screened from the High Street due to the setback position.
- 7.2. Section 4 page 9 of this report outlines the desirable indoor ambient noise levels expected for steady external sources within living rooms and bedrooms.
- 7.3. The indoor ambient and maximum noise levels within the rooms at the assessed location has been determined by calculation using the data in Tables 6 and 7 above, the room dimensions below and the sound reduction indices (*R*) of the building products in Table 8 below.

Living Room size 4.4mW x 6.75mL x 2.4mH windows 4m²

Bedroom 2 size 3mW x 4.5mL x 2.4mH windows 3m²

Element	<i>R_w</i>	Sound Reduction Index, <i>R</i> 1/1 octave band centre frequency between 31.5Hz and 4kHz						
		63	125	250	500	1k	2k	4k
External wall	50	28	34	41	45	54	58	58
Front Façade 6.8mm Pilkington /18mmArgon (90%)/4mmPilkington	41	20	25	27	38	48	47	55
Rear and side Façades 4mmglass/12mmAir/4mmglass	30	13	23	18	26	38	44	38
	<i>D_{n,e,w}</i>	Normalized Level Difference <i>D_{n,e}</i>						
Rear and side Façades Greenwood 5000EAW.AC2 ventilation	42	33	42	40	36	48	53	56

Table 8: Sound Reduction Indices, *R* and normalised level difference in dB

- 7.4. The calculated indoor ambient noise levels within the unit 3 living/kitchen/dining room and bedroom 1, corrected for distance but not considering any mitigation have been shown, with the appropriate assessment criteria, in Table 9.

Living Room Day 07:00 – 23:00		Bedroom 2 Night 23:00 – 07:00	
<i>L_{Aeq,16hr}</i>	Criteria	<i>L_{Aeq,8hr}</i>	Criteria
28	35	23	30

Table 9: Indoor Ambient Noise Levels in dB.

- 7.5. As Table 9 shows the internal ambient noise levels are below the BS 8233:2014 acoustic criteria.

- 7.6. The full assessment has used **closed windows and no trickle vents** to achieve the indoor ambient noise criteria adjacent to the High Street. Relying on closed windows to meet the guide levels in the BS8233 Standard, requires an appropriate alternative ventilation system in habitable rooms. **The full ventilation strategy should be specified by others.**

Maximum Noise Levels

- 7.7. The front of the development is affected by reasonable high maximum noise levels as shown in Table 7 page 17. The enhanced glazing used to achieve the BS 8233 criteria will reduce maximum levels significantly however to achieve the target of $L_{\max}$ 45dB(A) no more than ten times a night, 3 sided 1.5m high solid balcony screens should be installed on all balconies facing the High Street to screen road traffic noise maximums.
- 7.8. This enhancement will reduce maximum noise levels inside the front bedrooms by a further 5dB which should ensure the target $L_{\max}$ 45dB(A) is met.
- 7.9. The bedroom balcony screens that will be installed to mitigate internal maximum noise levels will reduce overall noise levels below the levels shown in Table 9.
- 7.10. Full recommendations are given in Section 2 of this report.



8. Acoustic Design Statement

Stage 1: Initial Site Noise Risk Assessment

- 8.1. The ambient noise level affecting the front façade were $L_{Aeq,5hr}$ 66dB and $L_{Aeq,8hr}$ 61dB, so the site is in the medium-risk category during the day and medium/high-risk category during the night. In these categories the risk may be reduced by following a good design process that is demonstrated in a detailed Acoustic Design Statement (ADS).

Stage 2: Element 1 & 2 – Good Acoustic Design process/Internal Noise Level Guidance

- 8.2. To ensure that good acoustic conditions exist in all habitable rooms facing the High Street the flats should have enhanced glazing (R_w 41dB) units with no trickle vents. The rear façade windows should have standard double glazing (R_w 30dB) units with acoustic trickle vents, as specified in Section 2 page 5 above, should be installed.
- 8.3. The glazing would reduce the internal ambient noise level to achieve the guideline levels with **windows closed and no trickle ventilation**. To achieve the ProPG Planning and Noise 2017 night-time maximum noise level guidance, the first and second floor bedrooms facing the High Street should have 3 sided 1.5m high glass or equivalent solid balcony screens installed. The solid balcony screens should reduce the maximum noise levels by a further 5dB.
- 8.4. Acoustic trickle vents are acceptable for windows on the side and rear façades. To achieve sufficient airflow to have a cooling effect, alternative means of ventilation may be required.

Stage 2: Element 3 – External Amenity Area Noise Assessment

- 8.5. Units 1 and 2 have private gardens and patios and units 5, 6, 7, 10,11, 12, 13 and 14 have balconies which are all on the rear façade and are further from the High Street and substantially screened from road traffic noise by the building, these amenity areas ambient noise levels will be below the lower guideline value of 50dB.
- 8.6. Units 3 and 4 have balconies at the front of the development facing the High Street, where the dominant noise source is road traffic noise. 3 sided 1.5m high glass or equivalent solid balcony screens will reduce external noise levels by a conservative 5dB to 61dB(A) which will still be above the upper guideline value. The convenience of the location and adjoining the strategic transport network is a compromise for the elevated external noise levels and do not outweigh the benefit of outdoor amenity space.



Stage 2: Element 4 – Assessment of Other Relevant Issues

- 8.7. Enhanced double glazing R_w 41dB at the front of the flats with no trickle vents and standard double glazing R_w 30dB with acoustic vents at the rear and side of the flats with acoustic trickle vents, reduces internal ambient noise levels below the desirable level criteria specified in BS8233 and will ensure internal noise levels are below the NPSE Lowest Observed Adverse Effect Level (LOAEL) during the day and night.
- 8.8. To ensure individual noise events do not normally exceed 45dB $L_{Amax,F}$ more than 10 times a night, in the bedrooms at the front of the development in addition to the enhanced glazing will have 3 sided 1.5m high glass or equivalent solid balcony screens installed on the first and second floors.
- 8.9. This Environmental Noise Assessment provides all the appropriate evidence and discussion on the good acoustic design consideration for this development.



9. Vibration Monitoring

- 9.1. The proposed development may be subject to vibration from road, rail and the haulage tunnel below the adjacent property.
- 9.2. The existing vibration affecting the site was monitored between the 16th and 21st July 2025 at V1, described in Table 10 below, was undertaken using a Sigicom C22 Wireless Vibration Monitor serial number 104366, fixed to an adjacent residential building's masonry wall above full foundations. The foundations of the existing building would be similar to that used in the proposed block and exposed to similar vibration levels.

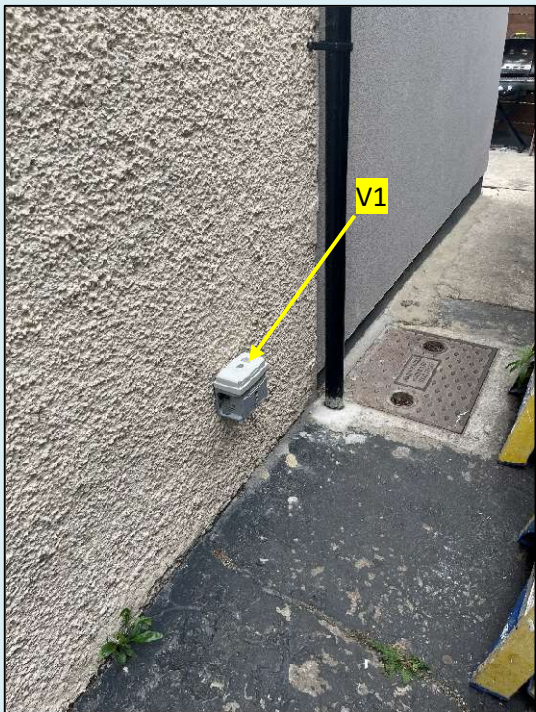
Location	Photo	Vibration Sources
V1 Fixed to the western façade of 67 High Street		Road traffic, trains, haulage road tunnel

Table 10: Vibration monitoring location V1.

10. Vibration Assessment

10.1. Table 11 shows the measured vibration dose values (VDV) levels with the appropriate assessment criteria.

Date	Day VDV	Low probability of Adverse comment $m/s^{-1.75}$	Date	Night VDV	Low probability of Adverse comment $m/s^{-1.75}$
16 th July			16th/17th July	0.029	0.1 to 0.2
17th July	0.012	0.2 to 0.4	17th/18th July	0.004	0.1 to 0.2
18th July	0.013	0.2 to 0.4	18th/19th July	0.003	0.1 to 0.2
19th July	0.014	0.2 to 0.4	19th/20th July	0.003	0.1 to 0.2
20th July	0.025	0.2 to 0.4	20th/21st July	0.004	0.1 to 0.2

Table 11: Day and night-time vibration dose values at V1 in dB.

10.2. Table 11 shows the day and night VDV's are below the BS 6472-1:2008 low probability of adverse comment criteria, no vibration mitigation measures are required for the proposed development.

11. Glossary of Acoustic Terminology

dB(A)

The human ear is less sensitive to low (below 125Hz) and high (above 16kHz) frequency sounds. A sound level meter can be used to duplicate the ear's variable sensitivity to sound across a spectrum of frequencies. This is achieved by building a filter into the instrument with a similar frequency response to that of the average ear. This is called an "A-weighting filter". Measurements of sound made with this filter are called A-weighted sound level measurements and the unit is dB(A).

$L_{eq,T}$

The sound from noise sources often fluctuates widely during a given period of time. An average value can be measured, the equivalent sound pressure level L_{eq} . The L_{eq} is the equivalent sound level which would deliver the same sound energy as the actual fluctuating sound measured in the same time period (T).

$L_{10,T}$

This is the minimum level exceeded for not more than 10% of the time period (T). This parameter is often used as a "not to exceed" criterion for noise.

$L_{90,T}$

This is the minimum level exceeded for not more than 90% of the time period (T). This parameter is often used as a descriptor of "background noise" for environmental impact studies.

L_{fmax}

This is the maximum sound pressure level that has been measured over a period using a fast time constant.

Octave Bands

In order to completely determine the composition of a sound it is necessary to determine the sound level at each frequency individually. Usually, values are stated in octave bands. The audible frequency region is divided into 10 such octave bands whose centre frequencies are defined in accordance with international standards.

Addition of noise from several sources

Noise from different sound sources combine, on a logarithmic scale, to produce a sound level higher than that from any individual source. Two equally intense sound sources operating together produce a sound level which is 3dB higher than one alone and 3 identical sources produce a 5dB higher sound level.

Attenuation by distance

Sound which propagates from a point source in free air attenuates by 6dB for each doubling of distance from the noise source. Sound energy from line sources (e.g. stream of cars) drops off by 3dB for each doubling of distance.



Subjective impression of noise

Sound intensity is not perceived directly at the ear; rather it is transferred by the complex hearing mechanism to the brain where acoustic sensations can be interpreted as loudness. This makes hearing perception highly individualised. Sensitivity to noise also depends on frequency content, time of occurrence, duration of sound and psychological factors such as emotion and expectations. The following table is a reasonable guide to help explain increases or decreases in sound levels for many acoustic scenarios.

Change in sound level (dB)	Change in perceived loudness
1	Imperceptible
3	Just barely perceptible
6	Clearly noticeable
10	About twice as loud
20	About 4 times as loud

Barriers

Outdoor barriers can be used to reduce environmental noises, such as traffic noise. The effectiveness of barriers is dependent on factors such as its distance from the noise source and the receiver, its height and its construction.

Reverberation control

When sound falls on the surfaces of a room, part of its energy is absorbed, and part is reflected back into the room. The amount of reflected sound defines the reverberation of a room, a characteristic that is critical for spaces of different uses as it can affect the quality of audio signals such as speech or music. Excess reverberation in a room can be controlled by the effective use of sound-absorbing treatment on the surfaces, such as fibrous ceiling boards, curtains and carpets.

