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Noise Impact Assessment Report for Class MA Permitted Development Application

80-82 High Street, Littlehampton, BN17 5DX

Report Reference 22137.PDNIA.RPT.01

ES Acoustics Limited Registered in England Company No. 14373293
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Prepared For	RNNS Property Group Limited
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Principal Author	Billy Clark, Senior Acoustic Consultant
Report Checked By	Duncan Arkley MIOA, Principal Acoustic Consultant

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Principal Author Contact Details		
Name	**Telephone No.**	**Email Address**
Billy Clark	[redacted]	

EXECUTIVE SUMMARY

An environmental noise survey and a noise impact assessment have been undertaken for the Proposed Development at 80-82 High Street, Littlehampton, BN17 5DX in support of a Class MA Permitted Development application for the conversion of commercial to residential.

An initial site inspection of the application site surroundings indicated limited commercial noise sources with a direct line of sight to the proposed first floor residential façades. The primary noise sources identified were road traffic from the adjacent East Street, with contributions from the nearby pedestrian crossing, and pedestrian noise from the adjacent High Street to the front and road traffic from the nearby Clifton and Arcade Road to the rear.

However, it is anticipated that some commercial noise may transmit to the proposed residential property from nearby external plant installations serving surrounding buildings and via sound transfer through the party floor, which will be shared with a proposed commercial unit.

By following the rigorous calculation procedure outlined in Section G.2 of Annex G of BS8233:2014 the sound insulation performance for the whole existing building envelope was assessed, considering each individual façade element.

Internal noise levels were predicted based on the worst-case noise levels measured. Calculations noted that the current external building fabric constructions would be sufficient to meet the set internal noise criteria.

A summary of the resultant levels are shown in the table below:

Facade	Time	Criteria	Internal Noise Level
East	07:00-23:00	≤ 30 dB L_{Aeq}	29 dB L_{Aeq}
	23:00-07:00	n/a	n/a
West	07:00-23:00	≤ 30 dB L_{Aeq}	26 dB L_{Aeq}
	23:00-07:00	n/a	n/a

As shown above, the existing glazing system would be sufficient to meet the set internal noise criteria targets, therefore ensuring that the future residents are adequately protected from noise impacts from commercial premises.

An assessment of the party floor construction was undertaken, with no upgrades deemed necessary to ensure impacts from commercial premises upon the future occupants of the development site, with regards to noise transfer via the party floor, are suitably mitigated.

CONTENTS

LIST OF ATTACHMENTS

1 INTRODUCTION

ES Acoustics Ltd has been commissioned by RNNS Property Group Limited to undertake an environmental noise survey and prepare a noise impact assessment for the Proposed Development at 80-82 High Street, Littlehampton, BN17 5DX, in support of a Class MA Permitted Development application for the conversion of office to residential.

The purpose of this report is to;

- Review the legislation presented in The Town and Country Planning (General Permitted Development) (England) (Amendment) Order 2015 with regards to Class MA;
- Determine noise levels incident on the Proposed Development from commercial sources via an environmental noise survey;
- Undertake an acoustic assessment of the existing external building fabric constructions to confirm whether sufficient sound insulation is provided;
- Undertake an assessment of the existing party floor sound insulation provision to ensure no adverse impact with regards to direct noise transfer from commercial premises; and
- Where appropriate provide outline mitigation advice to ensure there is no impact from commercial premises on the future occupiers of the development.

1.1 Forward to Noise Assessment

This noise impact assessment covers the legislation presented in The Town and Country Planning (General Permitted Development) (England) (Amendment) Order 2015, specifically:

"Class MA. Development consisting of a change of use of a building and any land within its curtilage from a use falling within Class E (commercial, business and service) of Schedule 2 to the Use Classes Order to a use falling within Class C3 (dwellinghouses) of Schedule 1 to that Order."

When considering a change of use to residential via the above legislation, it is important to note that in terms of legislation, the assessment only needs to consider noise specifically from commercial premises (which in this case is understood to mean any Class E use). Under Permitted Development legislation there is no requirement to consider noise from transportation noise sources such as road traffic, railways, or aircraft.

Nevertheless, the measurements of existing noise undertaken as part of the process would unavoidably include some contribution of noise from road traffic and other activity within the surrounding area with regards to externally generated noise.

2 PROPOSED DEVELOPMENT

2.1 Proposal

The proposal involves the conversion of the first floor of the building at 80-82 High Street, Littlehampton, BN17 5DX, to residential use containing three apartments, under Class MA of The General Permitted Development Order (2015). Proposed site plans are shown in Appendix B.

2.2 Site Description

The application site is located on Littlehampton High Street. The site is located in an area of mixed use and mixed character, comprised of predominantly commercial and residential uses.

As the key noise consideration of a Class MA application is the assessment of "*impacts of noise from commercial premises on the intended occupiers of the development*", all neighbouring commercial units are annotated and listed below, with the application site boundary shown in red:

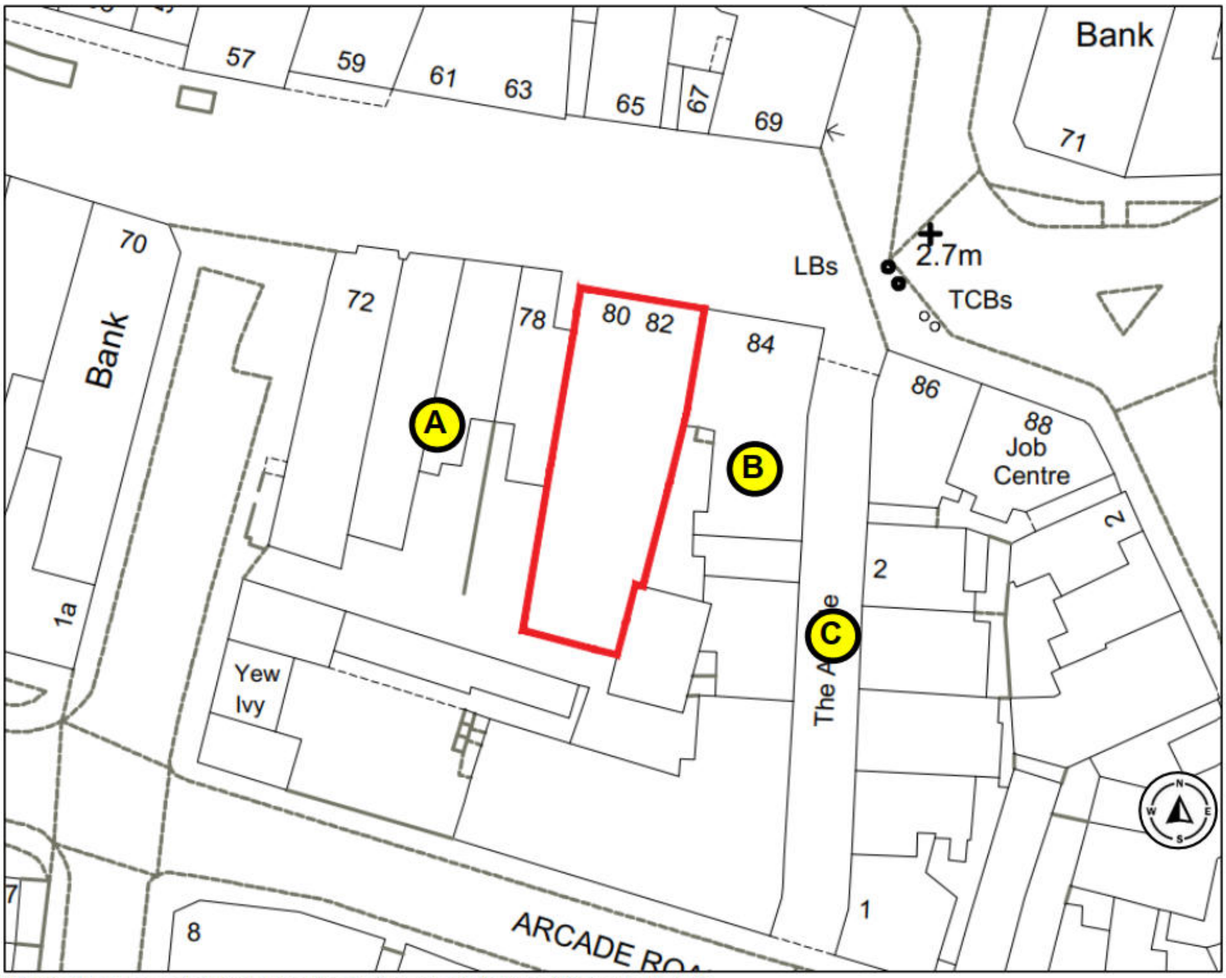


Figure 1 Proposed development site (Image Reference: Google Maps)

A. *Commercial Properties at 72-78 High Street*

B. *Kamsons Pharmacy at 84 High Street*

C. *Commercial Properties on The Arcade*

Observations and listening tests on site noted the following:

- Noise emissions associated with road traffic from the adjacent East Street, with contributions from the nearby pedestrian crossing, and pedestrian noise from the adjacent High Street were the primary contributing factor to noise levels at the north facade of the development site.
- Noise emissions associated with road traffic from the adjacent Clifton and Arcade Road were the primary contributing factor to noise levels at the south facade of the development site.
- Commercial plant installations were observed to the east, installed to the rear of Kamsons Pharmacy (B) and the commercial properties on The Arcade (C), and to the west, installed on the rear flat roof of one of the commercial properties at 72-78 High Street (A). Although it was not possible to verify the operation of the observed plant installations when on site, it would be assumed that noise from all nearby commercial plant would be audible at the east and west facades.

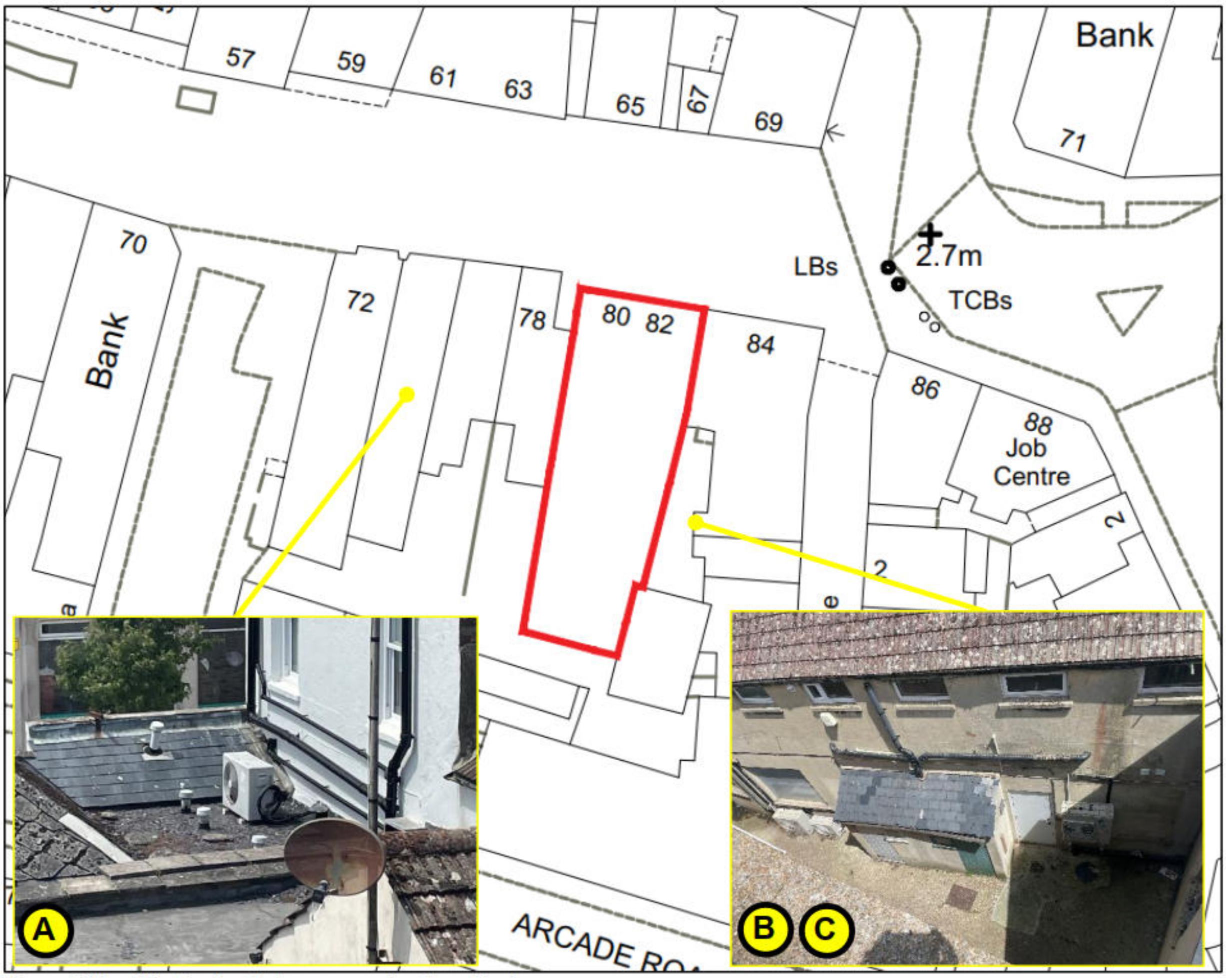


Figure 2 Identified potential sources of external noise

Measurement of the plant shown would not be practical due to the distances involved and the inability to isolate the individual noise sources, and therefore, an automated environmental noise survey position at the rear façade would aim to capture all external sources within the area incident upon the east and west façades.

With regards to direct noise transfer, the building shares party walls on either side with the first floor of the neighbouring 84 High Street to the east and 78 High Street to the west. When on site, it was observed that the first floor of both of these properties were occupied by residential tenants, and therefore direct noise transfer via this path would not be relevant to consider as part of the MA application.

However, it is understood that the currently unoccupied ground floor area of the development site is proposed to be retained as a commercial premises consisting of a Boots Retail and Pharmacy. An assessment will therefore be undertaken to determine the degree of impact the proposed ground floor commercial unit will have on the proposed residential apartments, with regards to direct noise transfer through the separating floor.

Additional information with regards to direct noise transfer is included in Section 6.0

3 NOISE ASSESSMENT GUIDANCE AND CRITERIA

3.1 The Town and Country Planning (General Permitted Development etc.) (England) (Amendment) Order 2021

The General Permitted Development Order (2015) affords permitted changes of use in the form of Class MA – from a use falling within Class E (commercial, business and service) to a use falling within Class C3 (dwellinghouse).

Development under Class MA is permitted subject to several conditions, one of which is to assess "*impacts of noise from commercial premises on the intended occupiers of the development*".

3.2 Best Practice and Guidance

Suitable guidance is presented below to ensure that impacts of noise from commercial premises on the intended occupiers of the development are adequately assessed.

3.2.1 World Health Organization (WHO) Guidelines

WHO Environmental Noise Guidelines for European Region (WHO, Regional office for Europe, 2018) have now supplemented elements of the WHO Guidelines for Community Noise (1999) upon which Westminster City Council's Planning Noise Policy is based.

While this application is not a full planning application and instead a permitted development application, we would still consider the noise levels reported within the WHO Guidelines to be appropriate to ensure a good quality residential environment for future residents. The WHO guideline values most relevant to new residential development are outlined in the table below:

Specific Environment	Critical Health Effects	L_{Aeq} [dB]	Time [hours]	L_{Afmax} [dB]
Dwelling, indoors	Speech intelligibility and moderate annoyance, daytime and evening	35	16	n/a
	Sleep disturbance night-time	30	8	45
Outside bedrooms (from noise sources other than road traffic, railways, aircraft or wind turbines)	Sleep disturbance, window open (outdoor values)	45	8	60

Table 1 Guideline Values from WHO Guidelines for Community Noise (1999)

The effects of noise in dwellings are typically sleep disturbance, annoyance and speech interference. For bedrooms the critical effect is sleep disturbance. Indoor guideline values for bedrooms at night are 30dB L_{Aeq} for continuous noise and 45dB L_{Amax} for single sound events, but the guidance also notes that lower noise levels may be disturbing depending on the nature of the noise source.

The value of 45dB L_{Aeq} outside bedrooms (at night, due to the reference of sleep disturbance) assumes a partially open window, with the value was obtained by assuming that the noise reduction from outside to inside with the window open is 15dB i.e. 30dB + 15dB = 45dB. However, the logic of needing a window open would be for the purpose of purge ventilation (as defined in Approved Document F of the Building Regulations) or to provide increased ventilation rates for the purpose of overheating mitigation. With regards to purge ventilation, it is accepted that the internal noise criteria would not apply as it would only occur for short durations and is fully controllable by the occupant i.e. to remove paint odours or burnt toast smells, etc.

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

BS 8233:2014 provides guidance on recommended internal ambient noise levels in residential spaces. The recommended levels are supported by advice contained in the WHO Community Noise Guidelines, and are repeated in the table below for the sake of completeness:

Room	Daytime (07:00-23:00)	Night-time (23:00-07:00)
Living Room	35 dB $L_{Aeq,16hr}$	N/A
Dining Room	40 dB $L_{Aeq,16hr}$	N/A
Bedroom	35 dB $L_{Aeq,16hr}$	30 dB $L_{Aeq,8hr}$

Table 2 BS 8233:2014 indoor ambient noise levels for dwellings

The following notes should be considered alongside the levels presented above:

- *The levels presented above are for steady external noise sources without a specific character. Noise is considered to have a specific character if it contains features such as a distinguishable, discrete and continuous tone, is irregular enough to attract attention, or has strong low-frequency content, in which case lower noise limits might be appropriate*
- *The levels are based on annual average data and do not have to be achieved in all circumstances e.g. it is normal to exclude occasional events, such as fireworks night or New Year's Eve*
- *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*
- *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*
- *The levels outlined above are not applicable under "purge ventilation" conditions as defined by Approved Document F of the Building Regulations, as this should only occur occasionally e.g. to remove odour from painting or burnt food). However, the levels above should be achieved whilst providing sufficient background ventilation, either via passive or mechanical methods*

3.3 Criteria

Based on the guidance presented within World Health Organization Guidelines and BS 8233:2014, we would suggest internal noise criteria for daytime and night-time 5dB below the values presented in the tables above in cases where there is an obvious commercial noise source nearby.

This would apply to spaces internally of the east and west façades, but not the north (front) or south (rear) elevation. For the avoidance of doubt, the dominant source at the front and rear elevations was road traffic noise, where the standard BS 8233:2014 criteria would be appropriate.

This has been derived from the commonly accepted acoustic feature corrections of +5dB for distinguishable audible features, such as tonality, impulsivity and intermittency.

The proposed internal noise criteria for daytime and night-time are shown in the table below:

Room	**Daytime (07:00-23:00)**	**Night-time (23:00-07:00)**
Living Room	30 dB $L_{Aeq,16hr}$	N/A
Bedroom	30 dB $L_{Aeq,16hr}$	25 dB $L_{Aeq,8hr}$

Table 3 Project specific noise criteria for daytime and night-time based on the external noise environment and consideration of noise with a specific character

4 ENVIRONMENTAL NOISE SURVEY

4.1 Measurement Location and Procedure

Noise surveys were undertaken on the proposed site as shown in the figure below:

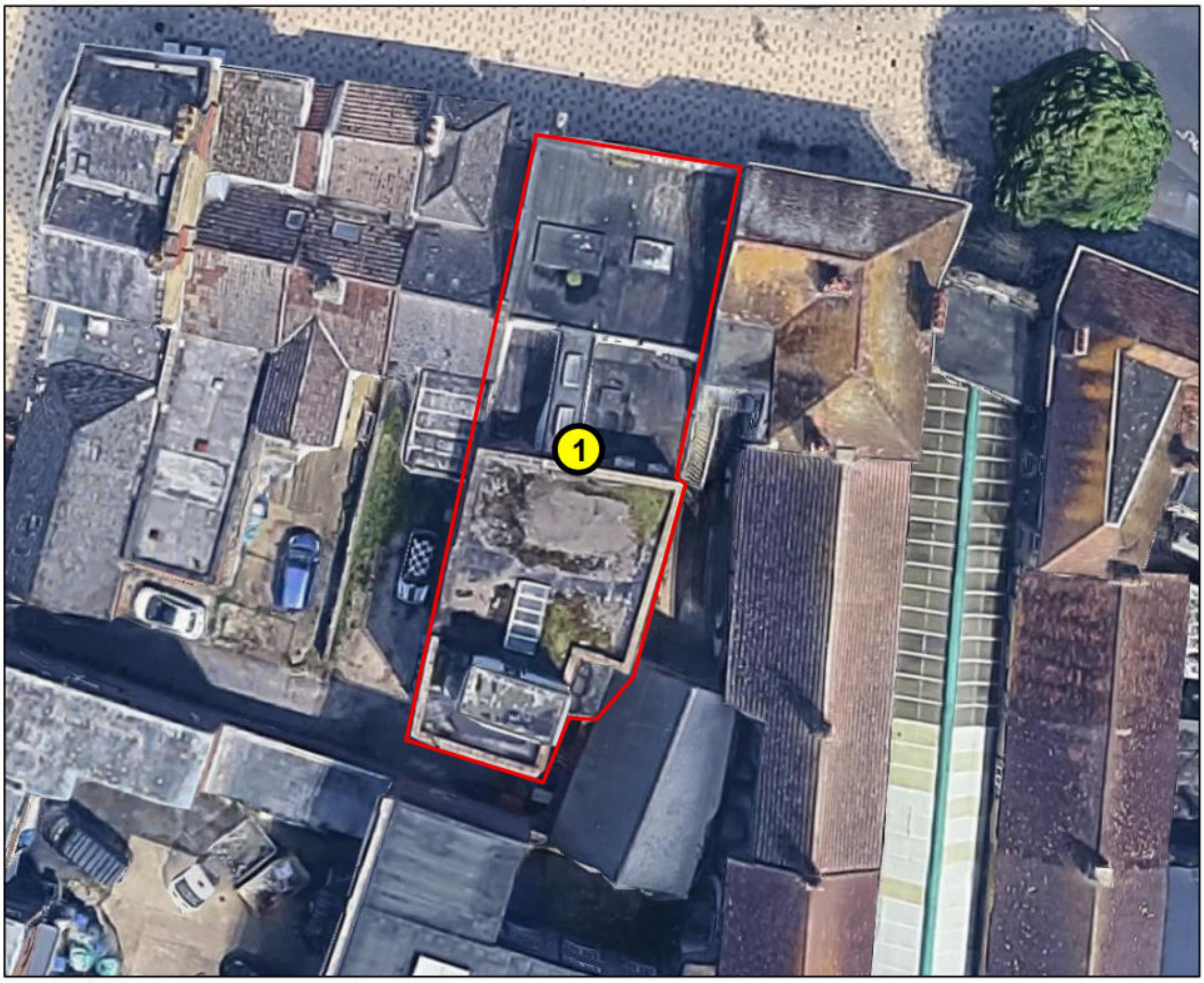


Figure 3 Noise survey measurement locations

The location was chosen in order to collect data representative of the worst-case levels expected on the site due to all nearby commercial sources and was undertaken between 13:00 on 23/06/2025 and 13:00 on 25/06/2025.

The measurement procedure complied with ISO 1996-2:2017 Acoustics '*Description, measurement and assessment of environmental noise - Part 2: Determination of environmental noise levels*'.

The key acoustic descriptors measured for this assessment are as follows:

- $L_{Aeq,T}$ *(the continuous equivalent A-weighted noise level over a given time period, T);*
- $L_{A90,T}$ *(the noise level exceeded for 90% of the measurement period T, referred to as the 'background' noise level); and*
- $L_{AFMax,T}$ *, the maximum sound level over each measurement period.*

4.2 Measurement Equipment

The table below presents the equipment used for the baseline noise surveys. The equipment calibration was verified before and after use and no abnormalities were observed.

Equipment	Make and Model	Serial Number
Sound Level Meter	Svantek 958 Class 1 Sound Level Meter	97759
Microphone Capsule	PCB 377B02	359419
Microphone Preamplifier	PCB 378B02	179795
Calibrator	Hangzhou Aihua Instruments Co. Ltd AWA 6021A	1008779

Table 4 Noise survey equipment

4.3 Weather Conditions

Weather conditions during the automated monitoring were generally dry with light winds and therefore suitable for the measurement of environmental noise.

Data on temperature, wind speed and precipitation has been sourced from the closest weather station[1] with accessible data.

Analysis of the time history and measurement results show that the levels of wind speed and precipitation have had no impact on the measured results.

4.4 Survey Results

4.4.1 Automated Environmental Noise Survey

Noise time histories of the measurement data are presented in Appendix C.

A summary of the measurement results is presented in the table below.

Period	Residual Sound Level $L_{Aeq,T}$ (dB)	10th Highest Maximum Noise Level (per night) L_{AFmax} (dB)
Daytime 07:00-23:00	54-57	n/a
Night-time 23:00-07:00	52-54	78, 80

Table 5 Measured noise levels

An additional daily and nightly breakdown of the data is presented in Table 6 below:

Date	Period	Residual Sound Level $L_{Aeq,T}$ (dB)
23/06/2025	Daytime 13:00-23:00	54
23-24/06/2025	Night-time 23:00-07:00	52
24/06/2025	Daytime 07:00-23:00	57
24-25/06/2025	Night-time 23:00-07:00	54
25/06/2025	Daytime 07:00-13:00	55

Table 6 Measured noise levels for daytime and night-time periods

[1] Weather Station: M0JGD Sullington UK. ID: AV099, located 15 km from the site at Latitude 50.921, Longitude -0.431

5 NOISE IMPACT ASSESSMENT

With regards to the numerous commercial premises surrounding the site and potential noise impact, the two key considerations would be as follows:

- ***External Noise*** *– Any source which could potentially transmit into the proposed dwellings via the building external building fabric (walls, doors, windows, etc)*
- ***Internal Noise*** *– Any source which could transmit via the party walls between the proposed development and adjacent commercial properties*

Assessments for both scenarios are presented below to ensure that suitable mitigation measures are proposed that would protect the future residents from noise.

5.1 External Building Fabric Assessment

5.1.1 Glazed Elements

A scheme of suitable noise mitigation measures to protect the proposed dwelling against external noise relates principally to the sound insulation performance of elements of the existing overall external building envelope.

The existing external building envelope is formed by a brickwork cavity wall, which will provide a high level of noise insulation by default. Therefore, as for most residential sites, the dominant path for external noise to enter rooms of the proposed dwelling will be via the windows.

The existing external building envelope also comprises single glazed windows, which would provide sound reduction in the range of R_w 29dB.

By following the rigorous calculation procedure outlined in Section G.2 of Annex G of BS8233:2014 the sound insulation performance for the whole building envelope is assessed, considering each individual element. Note that this calculation method is based on that given in BS EN 12354-3. The frequency range has been extended to include the 63Hz single octave band to ensure that the frequency characteristics of the plant noise is adequately considered.

Expected internal noise levels with the existing glazing system are presented in Table 7. In this instance, all windows overlooking the east and west facades are Living & Dining rooms, therefore this is reflected within the criteria below.

Facade	Time	Criteria	Internal Noise Level
East	07:00-23:00	≤ 30 dB L_{Aeq}	29 dB L_{Aeq}
	23:00-07:00	n/a	n/a
West	07:00-23:00	≤ 30 dB L_{Aeq}	26 dB L_{Aeq}
	23:00-07:00	n/a	n/a

Table 7 Expected internal noise levels with recommended glazing system implemented

As shown in Table 7, the expected internal noise levels would be within the recommended internal noise level guidance provided within BS 8233:2014 and WHO guidelines with the existing glazing system, which is therefore considered suitable to ensure that future residents are protected from environmental noise.

6 NOISE IMPACT ASSESSMENT – INTERNAL NOISE TRANSFER

The following section deals solely with potential internal noise impacts with regard to direct noise transfer through the party floor separating the ground floor commercial unit from the first-floor residential apartments.

Key aspects of the assessment are:

- The source noise levels within the proposed commercial unit (Section 6.1);
- The sound insulation performance of the party floor separating the ground floor commercial unit and first-floor residential apartments (Section 6.2);
- Establishing a suitable noise criterion based on planning policy and good practice guidance (Section 6.3); and
- The calculated level of direct noise transfer via the separating floor compared against the noise criteria (Section 6.4) to establish the likelihood of adverse impact.

6.1 Operational Noise Levels within the Commercial Unit

6.1.1 Commercial Noise

In order to establish accurate source noise levels of the commercial unit operation, levels have been sourced from BS 8233:2014 *'Guidance on sound insulation and noise reduction for buildings'*. This guidance provides examples of typical noise levels within non-domestic buildings.

As in this instance, the ground floor commercial unit will be occupied by a Boots retails store and pharmacy, the typical noise levels for a 'Department Store' would be considered representative of the operation noise levels of the proposed Boots, as presented within the Table below:

Activity	Location	Design Range, dB $L_{Aeq,T}$
Speech or telephone communications	Department Store	50-55

Table 8 Overall activity noise data for a 'Department Store'

As detailed above, the noise profile within the store would be expected to mainly consist of speech or telephone communications.

A spectral level with therefore be derived using the overall activity noise data presented above and considering the spectral shape of human speech, obtained from the sound pressure levels at 1m presented in ANSI/ASA S3.5-1997 (R2020) '*Methods For Calculation Of The Speech Intelligibility Index*', which is a recognised source in the United Kingdom for sound levels of human speech.

The spectral source noise levels of the commercial unit operation are therefore presented in the table below:

Unit	Octave band centre frequency sound pressure levels, dB								dB(A)
	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	
Commercial Unit Operation	28	38	50	54	52	42	36	28	55

Table 9 Human speech sound power levels

6.2 Sound Insulation Performance of the Separating Floor

Airborne sound insulation tests were undertaken on site to verify the sound insulation performance of the separating floor with regard to direct noise transfer. Full technical details of the sound testing methodology and equipment are presented in Appendix E.

A summary of the test rooms and results are presented in Table 10:

Test Element and No.	Source Room	Receiver Room	Test Result
Floor 1	Ground Floor Boots Retail	First Floor Boots Storage	D_w 39 dB

Table 10 Airborne test results

Note that for airborne sound insulation tests, the higher the result, the better the performance.

6.3 Assessment Criteria

The proposed internal noise criteria, as detailed within Section 3.3, are shown in the table below. As the operational hours of the adjoining commercial unit are during daytime hours only, criteria for direct noise transfer need only be applied during daytime hours.

Room	Daytime (07:00-23:00)
Living Room	30 dB $L_{Aeq,16hr}$
Bedroom	30 dB $L_{Aeq,16hr}$

Table 11 Project specific noise criteria for daytime based on the adjacent noise environment and consideration of noise with a specific character

In addition to the overall noise level, the frequency content of the noise should be considered in this instance.

Noise Rating (NR) curves are a method for rating the acceptability of indoor environments for the purposes of hearing preservation, speech communication and annoyance, based on curves developed by Kosten and van Os (1962). Sound pressure levels measured in octave bands are compared against the curves from which a single figure noise rating (NR) is obtained.

NR levels for residential spaces are presented in the table below for context:

Noise Rating Curve (NR)	Room Type / Application
NR30	Private dwellings

Table 12 Typical NR levels for private dwellings
Note: The NR Rating Curve above corresponds to an L_{Aeq} level.

NR curves are often used by Local Authorities and acoustic practitioners when setting a suitable noise target for a scenario under assessment, particularly when the frequency spectrum of the noise is important.

We would propose to use this method to assess frequency content of the internal noise transfer associated with the ground floor commercial unit operation.

Whilst Table 12 notes that NR30 is typical for private dwellings, with respect to the L_{Aeq} level, we would propose a more robust criterion of NR25.

Table 13 presents the full NR octave band frequency levels for the NR25 criterion curve.

Acoustic Descriptor	Receiver	NR Criterion Curve	Octave band centre frequency, Hz dB							
			63	125	250	500	1k	2k	4k	8k
L_{Aeq}	1st Floor Residence	NR25	55	44	35	29	25	22	20	18

Table 13 NR Criteria for L_{Aeq} noise levels

The criteria above would ensure that the amenity of the occupants is not compromised by the operation of the commercial unit.

A summary of the noise criteria for continuous noise is presented below:

Room	Overall Noise Level Criterion (dB)	Frequency Based Noise Criterion NR
Living Room	30 dB $L_{Aeq,16hr}$	NR25
Bedroom	30 dB $L_{Aeq,16hr}$	NR25

Table 14 Overall noise level criteria and NR criteria

6.4 Direct Noise Transfer Assessment via Party Floor

Direct noise transfer calculations of L_{Aeq} noise levels via the party floor separating the ground floor commercial unit and first floor residential use have been undertaken assuming representative L_{Aeq} noise levels as detailed in Section 6.1 and the measured sound insulation performance of the separating floor. Full calculations are presented in Appendix F.

A summary of resultant overall noise levels expected within the first-floor residential living & dining and bedroom is presented in Table 15.

Room	Criteria	Predicted Internal Level Within Residence
Living Room	30 dB $L_{Aeq,16hr}$	21 dB $L_{Aeq,}$
Bedroom	30 dB $L_{Aeq,16hr}$	21 dB $L_{Aeq,}$

Table 15 Direct noise transfer assessment with existing party floor

A summary of the predicted L_{Aeq} levels within the residential living rooms and bedrooms compared against the appropriate NR curves are shown in Figures 4 & 5 below:

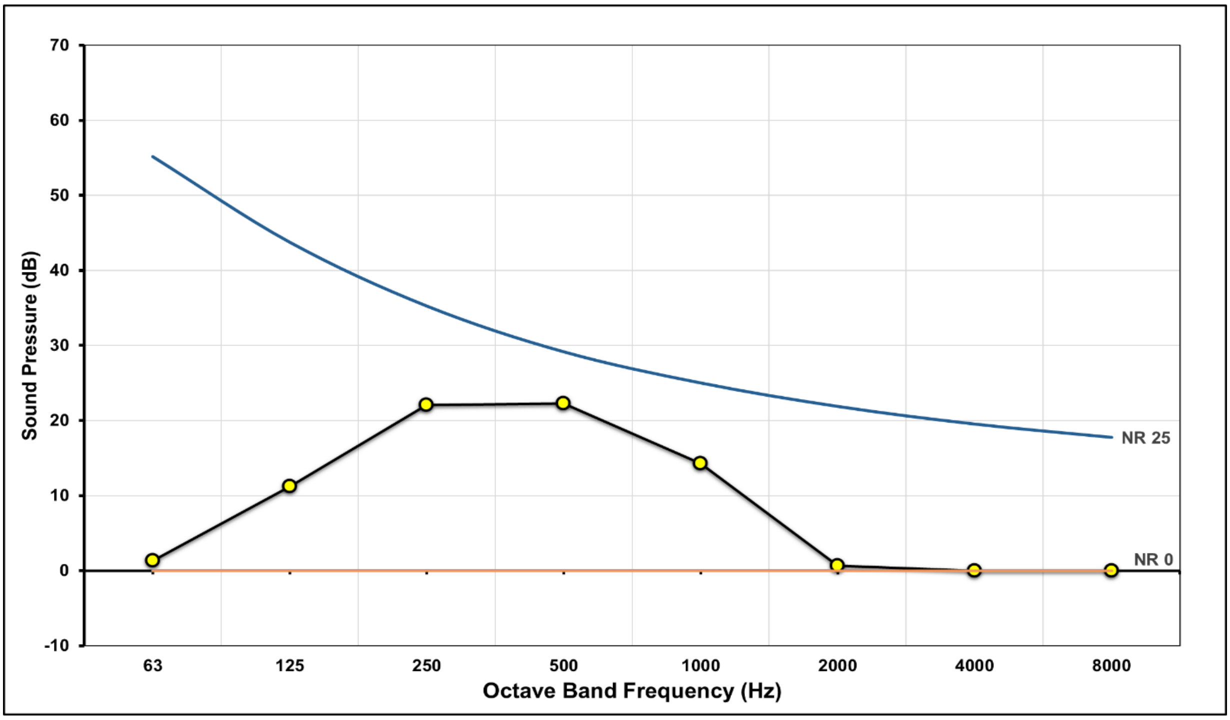


Figure 4 Predicted L_{Aeq} noise transfer from proposed commercial unit to residential living room against NR25 noise rating curve

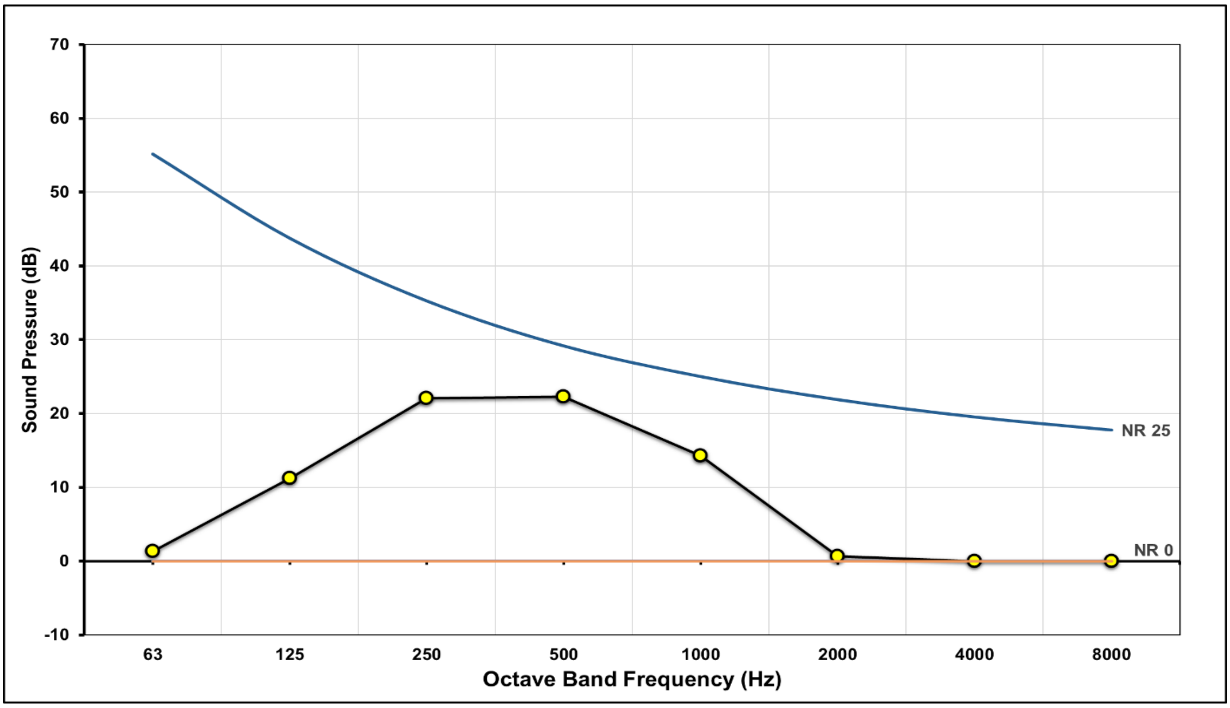


Figure 5 Predicted L_{Aeq} noise transfer from proposed commercial unit to residential bedroom against NR25 noise rating curve

For clarity, predicted noise level values (yellow points) below the curve demonstrate compliance with the criterion, while predicted noise level values above the curve would demonstrate a non-compliance.

Therefore, as demonstrated by the summarised results above and the detailed calculations in Appendix F, predicted levels of direct noise transfer via the party floor separating the ground floor commercial unit from the first-floor residential spaces would be expected to be well within the set criteria, ensuring the amenity of the residential apartments would not be compromised.

7 CONCLUSION

An environmental noise survey has been undertaken at the site of the Proposed Development at 80-82 High Street, Littlehampton, BN17 5DX.

Based on the results of the noise surveys a noise impact assessment has been undertaken. This assessment has concluded that impacts of noise from commercial premises on the intended occupiers of the development are unlikely to occur at the proposed residential development.

It is therefore considered that the site is appropriate for residential development.

APPENDIX A

GLOSSARY OF ACOUSTIC TERMINOLOGY

Decibel scale - dB

The decibel (dB) is a relative unit of measurement used in acoustics. The dB is a logarithmic ratio between a measured level and a reference level of 0 dB (i.e the threshold of human hearing). Simply put, the decibel compresses the wide range of sounds we hear into more manageable numbers.

Addition of noise from several sources

Sound produced by multiple sound sources are added logarithmically e.g. power ratio of 2 = 3dB, power ratio of 10 = 10dB. Therefore, two equally intense sound sources operating simultaneously produce a sound level which is 3dB higher than a single source e.g. 60dB + 60dB = 63dB.

Subjective impression of noise

Human response to sound is highly individualized and often based on psychological factors such as emotion and expectation. Sensitivity to sound typically depends on the loudness, pitch, duration of the occurrence, and time of occurrence (e.g. a sound source could cause annoyance during the night where it would not during the day). The following table is a guide to explain increases or decreases in sound levels for many scenarios.

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

'A' Weighted Frequency Filter - dB(A)

The human ear is not equally sensitive in all frequencies. The A-weighting filter was devised to take this into account when undertaking noise measurements and allows a sound level meter to replicate the human ears response to sound.

$L_{Aeq, T}$

Sound can fluctuate widely over a given period. L_{Aeq} is the A-weighted equivalent continuous sound level, with T denoting the time period over which the fluctuating sound levels were averaged e.g. $L_{Aeq,16h}$ is the equivalent continuous noise level over an 16 hour period.

L_{A90}

A-weighted sound level exceeded for 90% of the measurement period, calculated via statistical analysis. The L_{A90} descriptor is typically used to establish background sound levels for noise impact assessments

L_{A10}

A-weighted sound level exceeded for 10% of the measurement period, calculated via statistical analysis.

L_{AFmax}

A-weighted sound level maximum sound pressure level that has been measured over a given time period

APPENDIX A

GLOSSARY OF ACOUSTIC TERMINOLOGY

Octave Bands

The audio or frequency spectrum of the human ear is in the range of 20Hz to 20 kHz. The spectrum tells how the energy of the sound signal is distributed in frequency. Octave bands divides the audio spectrum into 10 equal parts. The International Standards Organisation defines the centre frequency of these bands as 31.5Hz, 63 Hz, 125 Hz, 250 Hz, 500 Hz, 1kHz, 2kHz, 4kHz, 8kHz and 16kHz.

Noise Rating (NR) Curves

A method of rating noise using a set of curves relating octave band sound pressure levels. Typically used for building services systems within offices

Airborne sound

Sound radiated from a source into the surrounding air e.g. musical instruments, tv/radio, machinery/equipment. Airborne sound insulation refers to the reduction or attenuation of airborne sound, usually via a solid partition between a source and receiver.

Impact sound

Sound resulting from the impact between colliding objects, e.g. footfall impact upon a floor. Impact sound insulation refers to the resistance of a floor to the transmission of impact sound, typically via the installation of a ‘resilient layer’

Flanking sound

The transmission of airborne sound between two adjacent rooms by paths other than via the separating partition between the rooms, e.g. the abutment point of a wall and floor.

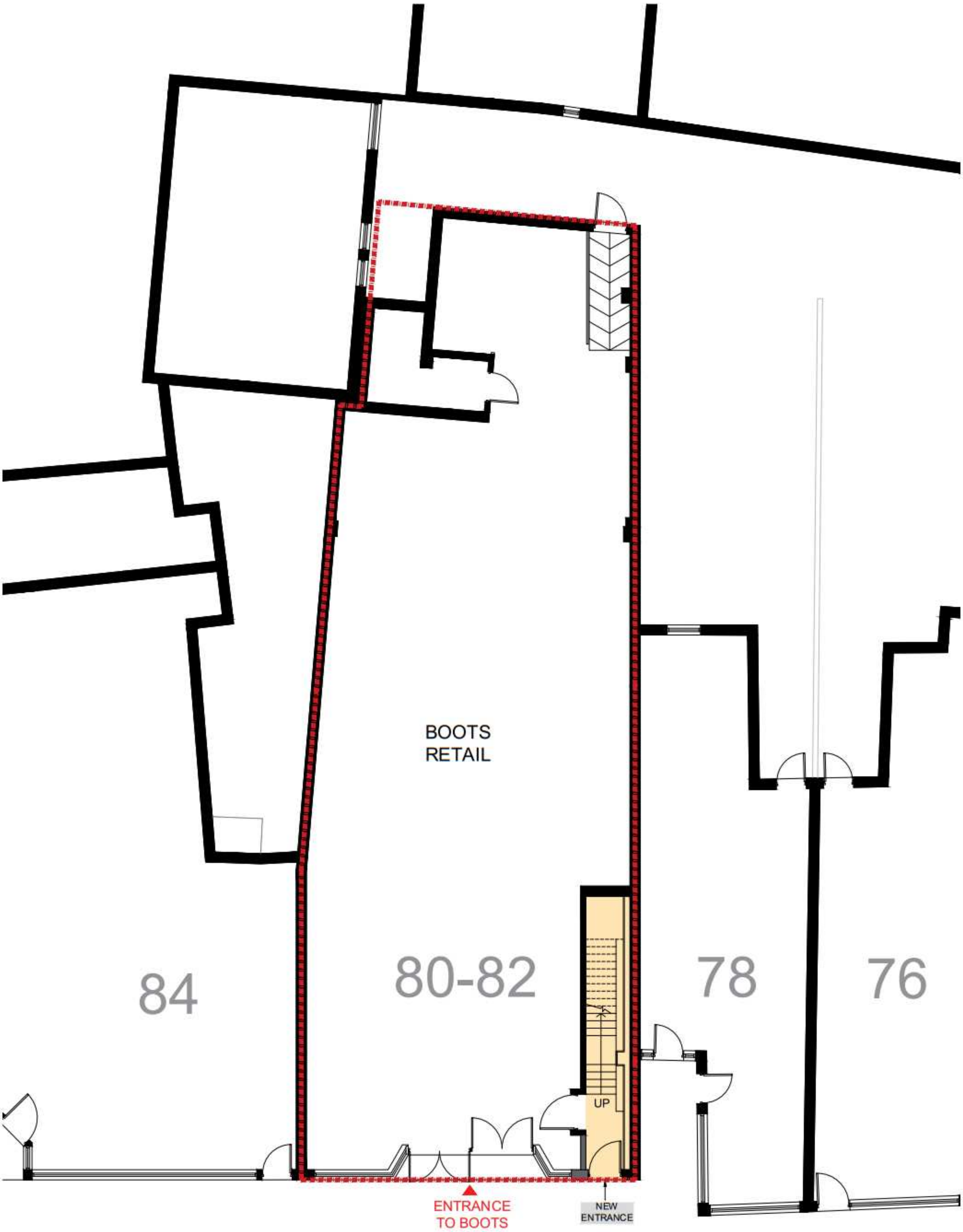
Structure-borne noise

Noise caused by the vibration of elements of a structure. This can result in reradiated noise, whereby the vibrating element transmits airborne sound into a space e.g. vibration caused by mechanical plant installed within a plant room which is not adequately isolated from the structure, or construction/demolition work in an adjacent building.

Reverberant sound

Sound in an enclosed space (usually a room), which results from repeated reflections at the boundaries. Reverberation time is the time taken for a steady sound level in an enclosed space to decay by 60dB, measured from the moment the sound source is switched off. A example of a typically reverberant space would be a classic church. Absorptive materials can be used to reduce reflections and reverberation times.

APPENDIX B

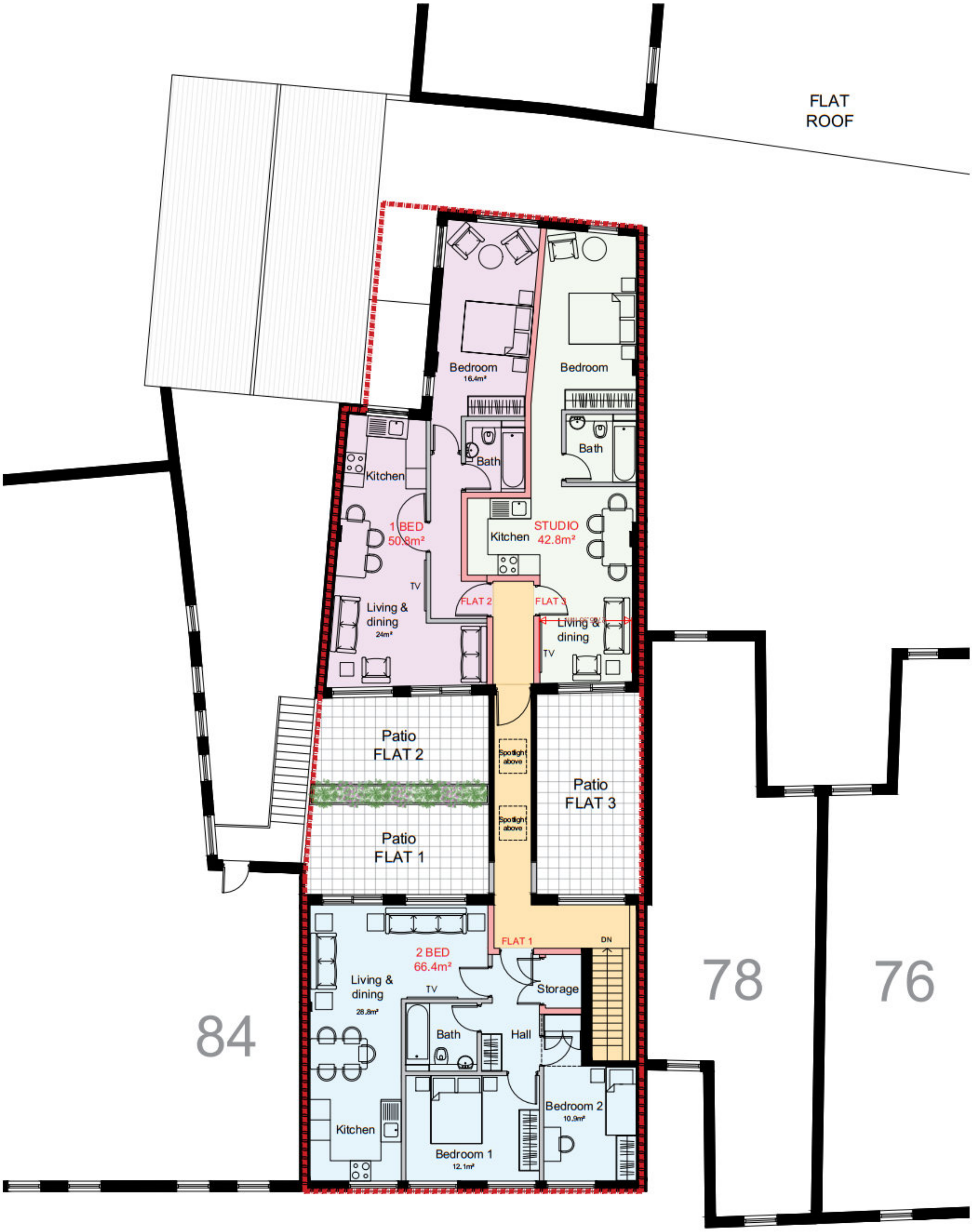


PROPOSED GROUND FLOOR PLAN

N 0m 1m 2m 3m 4m 5m

PROJECT	DWG NO.	SCALE	DETAIL	A 06.05.2025	PROJECT NO.	
80-82 HIGH STREET, LITTLEHAMPTON, WEST SUSSEX, BN17 5DX	65A	1:50 @ A1	PROPOSED GROUND FLOOR PLAN	ISSUED TO CONSULT.	23.06	PR Architecture ltd. Chartered Architect 120, Pinner Road, Harrow, HA1 4JD. Tel: 0208 357 2304
PLANNING						

APPENDIX B



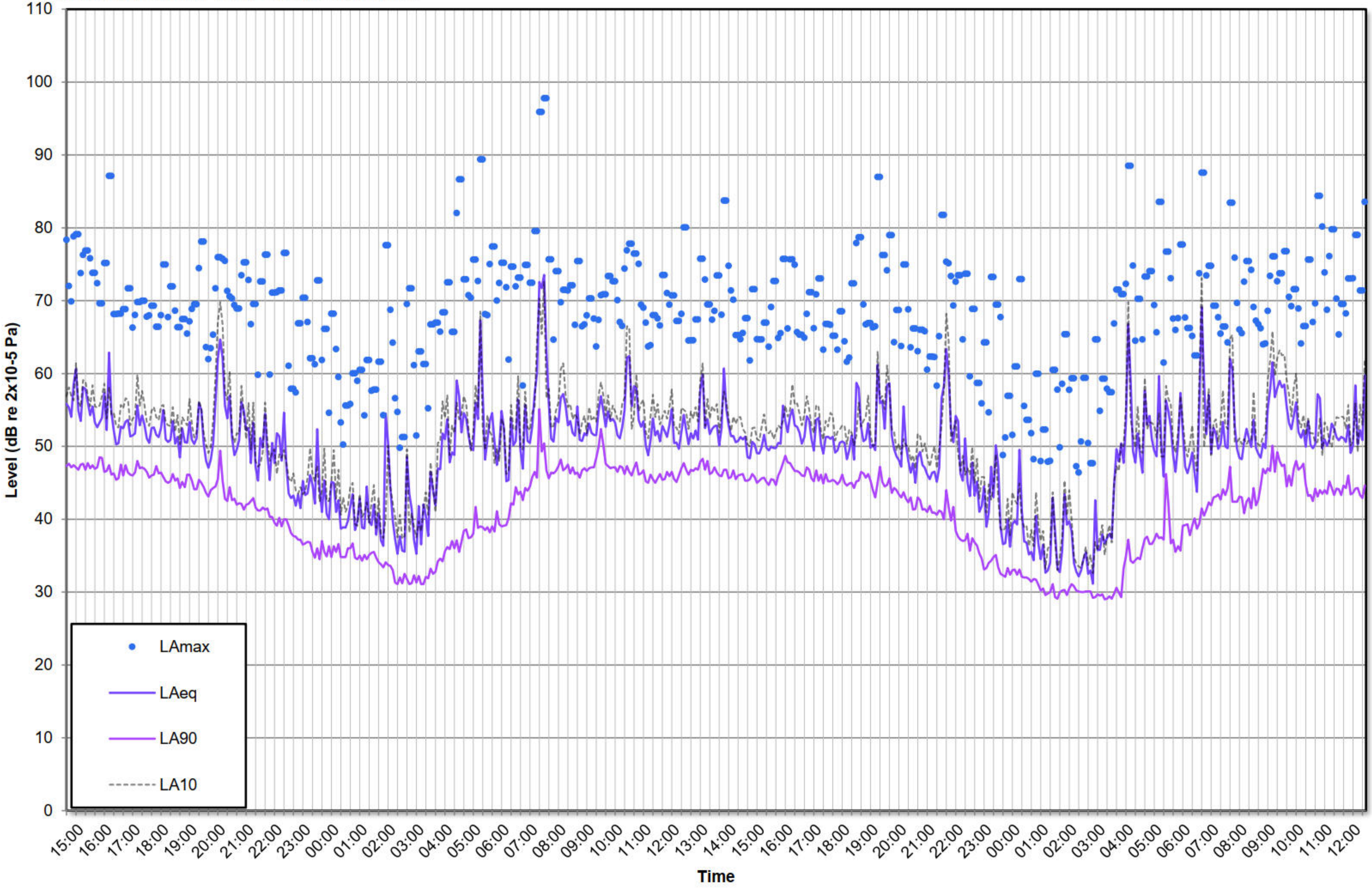
PROPOSED FIRST FLOOR PLAN

PROJECT	DWG NO.	SCALE	DETAIL	A 06.05.2025	PROJECT NO.	PR Architecture ltd.
80-82 HIGH STREET, LITTLEHAMPTON, WEST SUSSEX, BN17 5DX PLANNING	66A	1:50 @ A1	PROPOSED FIRST FLOOR PLAN	ISSUED TO CONSULT.	23.06	Chartered Architect 120, Pinner Road, Harrow, HA1 4JD. Tel: 0208 357 2304

Appendix C

22137.PNIA-RPT.01

13:00 on 23rd June to 13:00 on 25th June 2025



APPENDIX D

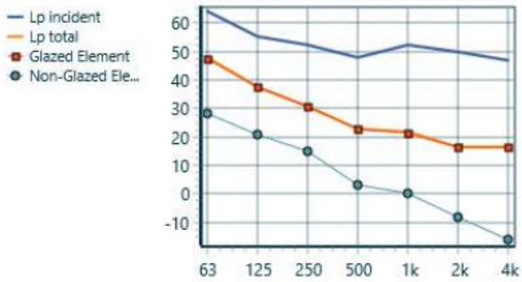
es acoustics

INSUL

Outdoor To Indoor Sound Transmission (v10.0.6)

Program copyright Marshall Day Acoustics
Margin of error is generally within ±3 dB
- Key No. 5203

Job Name: 80-82 High Street, Littlehampton, BN17 5DX
Job No.: 22137 Initials:BC
Date:07/07/2025
File Name:22137 East Daytime.inz



	Octave Band Centre Frequency (Hz)							
Source	63	125	250	500	1k	2k	4k	Overall dBA
Incident sound level (freefield)	64.0	55.0	52.0	48.0	52.0	50.0	47.0	56.2
Path								
Element 1 , STL	-16	-17	-21	-25	-30	-33	-30	
Facade Shape factor Level diff.	0	0	0	0	0	0	0	
Insertion Loss	0	0	0	0	0	0	0	
Area (+10LogA), 7 m²	8.6	8.6	8.6	8.6	8.6	8.6	8.6	
Element sound level contribution	48	38	31	23	22	17	17	28.9
Element 2 , STL	-37	-35	-38	-46	-53	-59	-64	
Facade Shape factor Level diff.	0	0	0	0	0	0	0	
Insertion Loss	0	0	0	0	0	0	0	
Area (+10LogA), 10 m²	10.0	10.0	10.0	10.0	10.0	10.0	10.0	
Element sound level contribution	28	21	15	3	0	-8	-16	10.4
Receiver								
Room volume (-10LogV), 50.00 m³	-6.0	-6.0	-6.0	-6.0	-6.0	-6.0	-6.0	
Reverberation time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
RT (+10LogT)	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	
Equation Constant	11	11	11	11	11	11	11	
Room sound level	48	38	31	23	22	17	17	28.9
Level difference								LpAinc - LpARev,T0
D2m,nT	19.6	20.6	24.5	28.6	33.6	36.6	33.6	27.3

** Element descriptions:

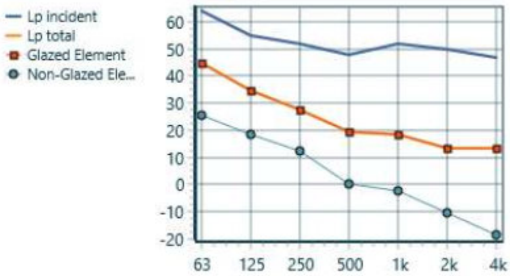
#1: Glazed Element
Glazing (Single):
- Pane 1: 1 x 3.5 mm Glass
- Details: Energy-based model, Panel Size 1.3 m x 1.5 m, Partition surface mass = 8.51 kg/m²

#2: Non-Glazed Element
Wall (Single):
- Panel 1: 1 x 160 mm Brick
- Details: Panel Size 2.7 m x 4.0 m, Partition surface mass = 256 kg/m²

APPENDIX D

Outdoor To Indoor Sound Transmission (v10.0.6)

Program copyright Marshall Day Acoustics
Margin of error is generally within ±3 dB
 - Key No. 5203
Job Name: 80-82 High Street, Littlehampton, BN17 5DX
Job No.: 22137 Initials:BC
Date:07/07/2025
File Name:22137 West Daytime.inz



	Octave Band Centre Frequency (Hz)							
Source	63	125	250	500	1k	2k	4k	Overall dBA
Incident sound level (freefield)	64.0	55.0	52.0	48.0	52.0	50.0	47.0	56.2
Path								
Element 1 , STL	-16	-17	-21	-25	-30	-33	-30	
Facade Shape factor Level diff.	0	0	0	0	0	0	0	
Insertion Loss	0	0	0	0	0	0	0	
Area (+10LogA), 4 m²	5.6	5.6	5.6	5.6	5.6	5.6	5.6	
Element sound level contribution	44	34	27	19	18	13	13	25.9
Element 2 , STL	-37	-35	-38	-46	-53	-59	-64	
Facade Shape factor Level diff.	0	0	0	0	0	0	0	
Insertion Loss	0	0	0	0	0	0	0	
Area (+10LogA), 6 m²	7.5	7.5	7.5	7.5	7.5	7.5	7.5	
Element sound level contribution	25	18	12	0	-3	-11	-19	7.9
Receiver								
Room volume (-10LogV), 50.00 m³	-6.0	-6.0	-6.0	-6.0	-6.0	-6.0	-6.0	
Reverberation time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
RT (+10LogT)	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	
Equation Constant	11	11	11	11	11	11	11	
Room sound level	45	35	28	20	19	14	13	25.9
Level difference								LpAinc - LpARev,T0
D2m,nT	22.6	23.5	27.5	31.6	36.6	39.6	36.7	30.3

** Element descriptions:

#1: Glazed Element
Glazing (Single):
- Pane 1: 1 x 3.5 mm Glass
- Details: Energy-based model, Panel Size 1.3 m x 1.5 m, Partition surface mass = 8.51 kg/m²

#2: Non-Glazed Element
Wall (Single):
- Panel 1: 1 x 160 mm Brick
- Details: Panel Size 2.7 m x 4.0 m, Partition surface mass = 256 kg/m²

APPENDIX E

SOUND INSULATION TESTING TECHNICAL INFORMATION

In order to establish the sound insulation performance of the separating floor between the application site and the first-floor residence, airborne sound insulation tests were undertaken in accordance with the following standards:

- BS EN ISO 16283-1:2014 *'Acoustics - field measurement of sound insulation in buildings and of building elements. Airborne sound insulation (ISO 16283-1:2014) (+A1:2017)'*
- BS EN ISO 717-1:2020 *'Acoustics - rating of sound insulation in buildings and of building elements. Airborne sound insulation'*

Airborne sound insulation tests require a 'source room' and 'receiver room'. The loudspeaker would be placed within the source room to generate the test signal, with the receiver room being used to measure a received level for a difference to be calculated across the test element.

ES Acoustics Ltd undertake the measurement process using a single sound source, as follows:

- The loudspeaker with 'pink noise' test signal is positioned within the source room in accordance with the standard, positioned to obtain a diffuse sound field;
- The average sound pressure level in the source and receiving rooms is measured in one-third octave bands using fixed microphone positions. For the source room measurements, the difference between the average sound pressure levels in adjacent one-third octave bands was observed to be no greater than 6dB as required by the standard;
- The loudspeaker with 'pink noise' test signal is then moved to a second position within the source room and the above procedure repeated;
- The level differences obtained from each source position should be arithmetically averaged to determine the level difference, D as defined in BS EN ISO 16283-1:2014;
- Background noise measurements are conducted in the 'receiver room' in accordance with BS EN ISO 16283-1:2014;
- The results of the tests are rated in accordance with BS EN ISO 717-1:2020 '*Acoustics - rating of sound insulation in buildings and of building elements. Airborne sound insulation'*

Appendix E

Sound Insulation Testing Technical Information

The equipment used for the sound insulation testing is summarised in the table below:

Equipment	Make and Model	Serial Number	Calibration Date	Certificate No.
Sound Level Meter	NTi XL3	A3A-01427-F0	UCRT25/1203	NTi XL3
Microphone Capsule	NTi MC230A	A30063	UCRT25/1205	NTi MC230A
Microphone Preamp	NTi MA230	1887	UCRT25/1208	NTi MA230
Calibrator	Hangzhou Aihua Instruments Co. Ltd AWA 6021A	1008779	18/12/2024	AWA6021A
Loudspeaker	RCF ART 310-A	VBCC01229	n/a	n/a
Signal Generator	NTi Audio Minirator MR-PRO	G2P-REKRZ-G0	n/a	n/a
Laser Measure	DTAPE Laser Distance Meter	2022103023995	n/a	n/a

Table 1 Equipment used for testing

Tests were undertaken between the following spaces:

- Source Room – Ground Floor Premises to Receiver Room – 1st Floor Open Plan Office

The results of the airborne testing are summarised in the table below:

Test Element	Source Room	Receiver Room	Test Area	Test Result
Floor	Ground Floor Boot Retail	First Floor Boots Storage	Approx. 86m^2	D_w 39 dB

Table 2 Airborne test results

Note that it was only possible to complete sound tests in one position between the ground floor unit and the first floor due to access requirements. However, based on the floor construction seen on site, similar results to those above would be expected for all areas.

The full graph showing the standardised level difference measured in accordance with ISO 140-4 is shown on the following page.

APPENDIX E

SOUND INSULATION TESTING TECHNICAL INFORMATION

Level difference in accordance with ISO 16283-1
Field measurements of airborne sound insulation between rooms

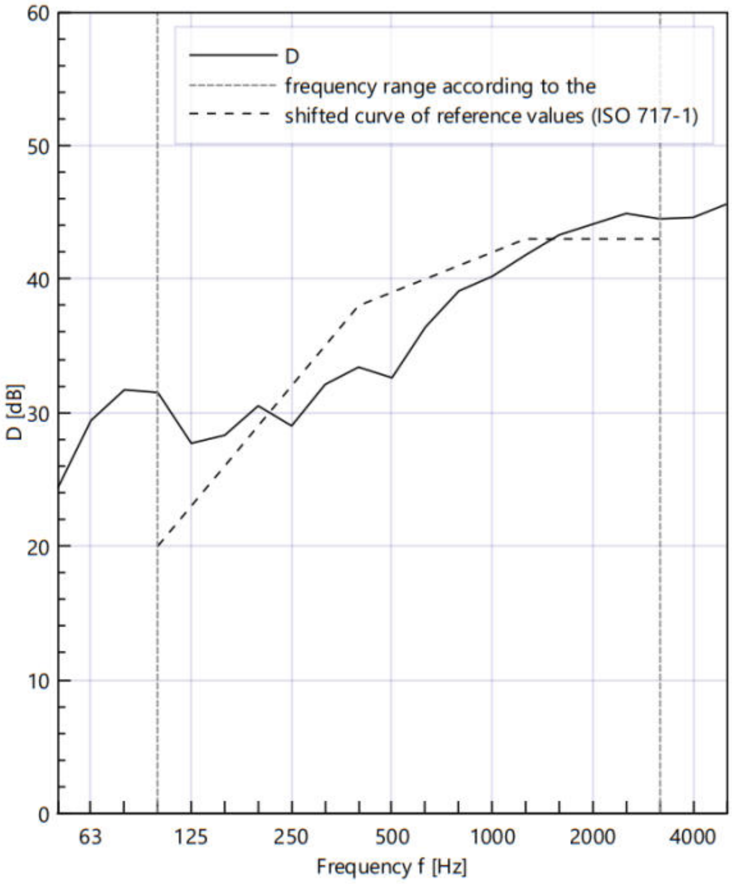
Client: RNNS Property Group Limited Date of test: 25/06/2025

Location: 80-82 High Street, Littlehampton, BN17 5DX

Ground Floor Boots Retail - First Floor Boots Storage

Sound Level Meter: A3A-01427-F0 (M2340: 1887)
Area of common partition: 86.00 m²
Source room volume: 284.00 m³
Receiving room volume: 648.00 m³

Frequency f Hz	D 1/3 octave dB
50	24.3
63	29.4
80	31.7
100	31.5
125	27.7
160	28.3
200	30.5
250	29.0
315	32.1
400	33.4
500	32.6
630	36.4
800	39.1
1000	40.2
1250	41.8
1600	43.3
2000	44.1
2500	44.9
3150	44.5
4000	44.6
5000	45.6



Rating in accordance with ISO 717-1:

$D_w(C;C_{tr})$ = 39 (-1; -3) dB

$C_{50-3150}$ = -1 dB; $C_{50-5000}$ = 0 dB; $C_{100-5000}$ = 0 dB

$C_{tr,50-3150}$ = -4 dB; $C_{tr,50-5000}$ = -4 dB; $C_{tr,100-5000}$ = -3 dB

Evaluation based on field measurement using results obtained by an engineering method.

Report No.: 22137
Date: 27/06/2025

APPENDIX F
NOISE TRANSFER CALCULATIONS

The **reverberant sound pressure level** (L_r) in the receiver room is based on the following equation:

$$L_r = L_p - R + 10\log(S) + 10\log\left(\frac{T_r}{0.161 * V_r}\right)$$

where

L_p is the reverberant sound pressure level within the source room, dB

R is the octave band sound reduction Index of the party floor, dB

S is the common area of the separating floor between the source and receiver room

T_r is the reverberation time in the receiver room

V_r is the volume of the receiver room

Calculation of noise via direct transfer L_{Aeq} to Open Plan Office									
Internal Building Fabric Details:									
Receiver:	Residential Living Room	**Description:**	Unknown material build-up - assumed concrete base construction						
Element:	Party Floor								
Area, m²:	24								
Receiver Room Volume, m³:	79								
Receiver Room Reverberation (*T*) at octave band (Hz):		**63Hz**	**125Hz**	**250Hz**	**500Hz**	**1kHz**	**2kHz**	**4kHz**	**8kHz**
		1	1	1	1	1	1	1	1
Assessment:									
		Octave Band Centre Frequency							
		63Hz	**125Hz**	**250Hz**	**500Hz**	**1kHz**	**2kHz**	**4kHz**	**8kHz**
L_p - reverberant sound pressure level within commercial unit (L_{Aeq})		28	38	50	54	52	42	36	28
R - octave band sound reduction Index of the party floor, dB		-29	-30	-31	-35	-41	-44	-45	-45
S - common area of the separating floor between the source and receiver room		14	14	14	14	14	14	14	14
Correction for room volume and reverberation time		-11	-11	-11	-11	-11	-11	-11	-11
Calculated Internal Sound Pressure Level in Flat:									
Worst-case Level $L_{Aeq(T)}$	**Overall dB(A)**	**Linear dB at Octave Band Centre Frequency**							
		63Hz	**125Hz**	**250Hz**	**500Hz**	**1kHz**	**2kHz**	**4kHz**	**8kHz**
L_{eq}	21	1	11	22	22	14	1	0	0

Calculation of noise via direct transfer L_{Aeq} to Open Plan Office									
Internal Building Fabric Details:									
Receiver:	Residential Bedroom	**Description:**	Unknown material build-up - assumed concrete base construction						
Element:	Party Floor								
Area, m²:	11								
Receiver Room Volume, m³:	36								
Receiver Room Reverberation (*T*) at octave band (Hz):		**63Hz**	**125Hz**	**250Hz**	**500Hz**	**1kHz**	**2kHz**	**4kHz**	**8kHz**
		1	1	1	1	1	1	1	1
Assessment:									
		Octave Band Centre Frequency							
		63Hz	**125Hz**	**250Hz**	**500Hz**	**1kHz**	**2kHz**	**4kHz**	**8kHz**
L_p - reverberant sound pressure level within commercial unit (L_{Aeq})		28	38	50	54	52	42	36	28
R - octave band sound reduction Index of the party floor, dB		-29	-30	-31	-35	-41	-44	-45	-45
S - common area of the separating floor between the source and receiver room		10	10	10	10	10	10	10	10
Correction for room volume and reverberation time		-8	-8	-8	-8	-8	-8	-8	-8
Calculated Internal Sound Pressure Level in Flat:									
Worst-case Level $L_{Aeq(T)}$	**Overall dB(A)**	**Linear dB at Octave Band Centre Frequency**							
		63Hz	**125Hz**	**250Hz**	**500Hz**	**1kHz**	**2kHz**	**4kHz**	**8kHz**
L_{eq}	21	1	11	22	22	14	1	0	0