

REPORT TITLE:

Noise impact assessment: Proposed Parkwood South Holland Temporary Gym Facility
within Boston College, Red Lion Street, Spalding PE11 1SX.

CLIENT DETAILS:

South & East Lincolnshire Councils Partnership

DATE:

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REPORT REFERENCE:

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Document Status and Revision Schedule

Issue/Revision	Description/Comments	Date	Prepared by	Approved by
-	Checked & authorised	30/6/25	MJ	JCB

1. Introduction

The proposed Parkwood South Holland Temporary Gym facility to be located within the Boston College building on Red Lion Street, Spalding, has been assessed based on potential activity noise within the building and the hours of operation.

The space comprises ground floor comprises a two studios with an open plan gym area at ground floor. Classrooms are located above the proposed gym demise and a training hair and beauty salon (Style Academy) attached to Boston College is located adjacent to the demise. Residential uses are located immediately adjacent to the site. All three receptor types are considered by this assessment.

The building and immediately local area is in the centre of Spalding, however the location is set away from busy traffic routes. An environmental noise survey has been undertaken adjacent to the residential dwellings on Red Lion Street, which represents the closest residential receptors.

Hours of operation are understood to be Monday-Friday 06:30-21:00hrs and Saturday/Sunday 08:00-16:00hrs.

Amplified music has been the focus of our assessment as a worst case. An assessment of the current performance of the building envelope has been achieved through in-situ testing and based on the results obtain and a statement of maximum noise levels within the studio and gym areas potential for residential disturbance has been assessed.

Measurements of sound insulation in-situ have also determined the sound insulation performance laterally between studios, from studio to beauty salon and between ground and first floor classrooms and to outside.

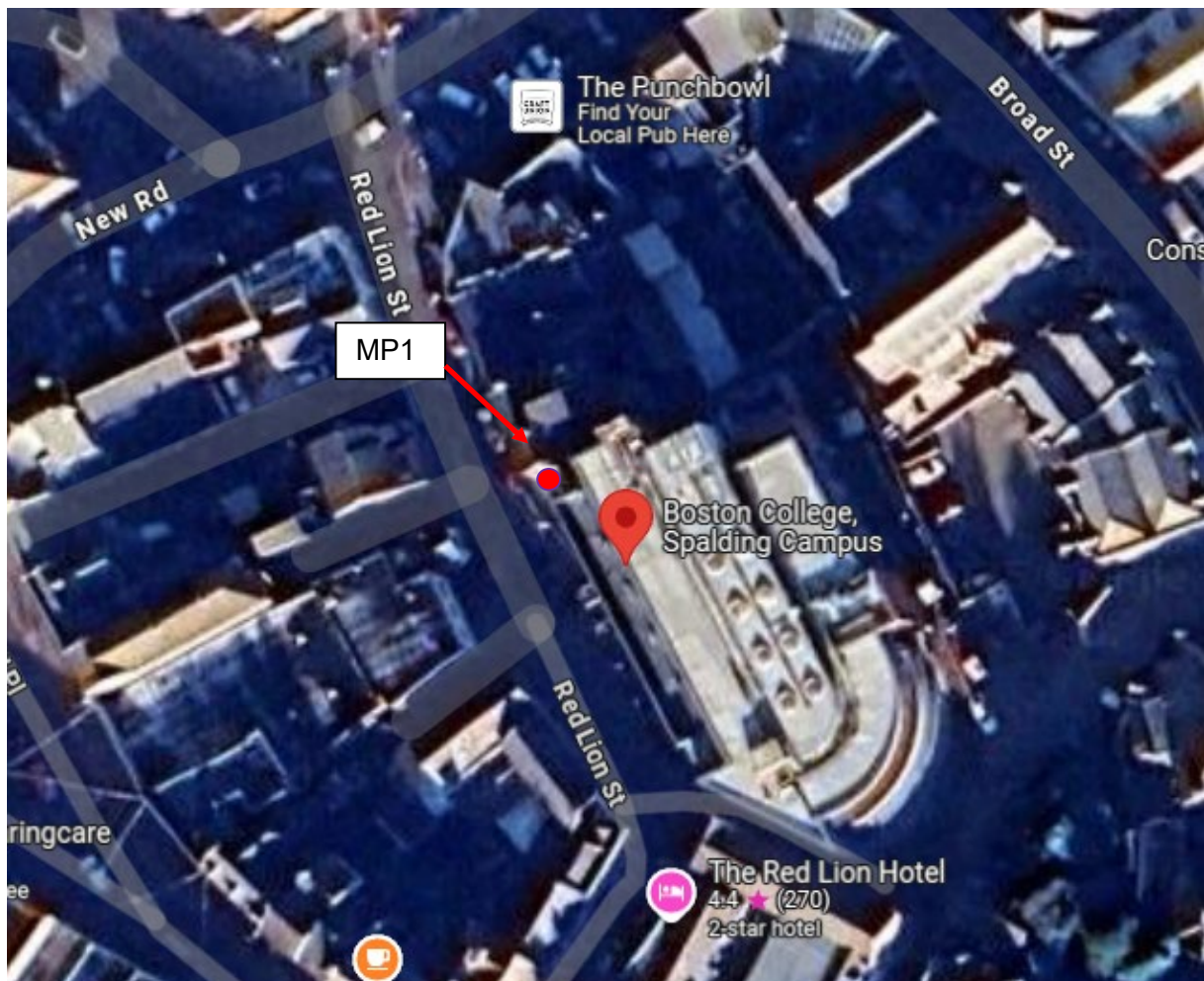
Use of gym noise data at the worst case level advised by the noise management statement for the project, has been overlaid against sound insulation performance and underlying ambient noise levels at each receptor to assess the potential for disturbance from amplified music.

It is expected that excessive noise transmission to existing residents would be avoided by the low activity noise levels suggested for the scheme ensuring the protection of residents.

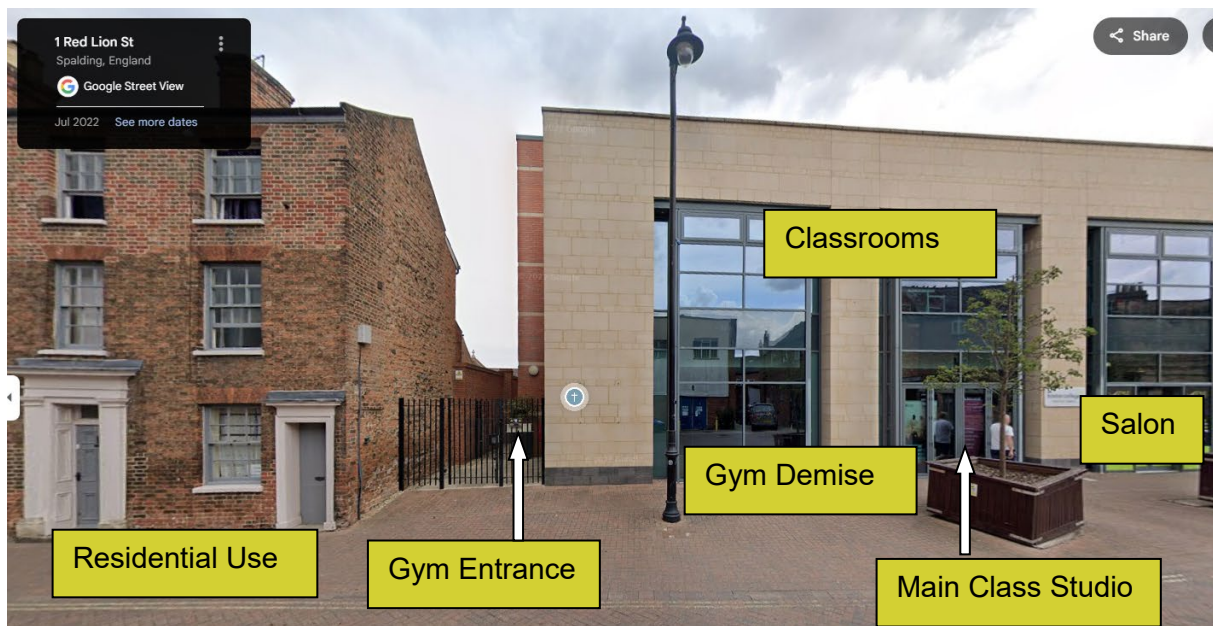
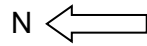
2. The Site

2.1 Location and Description

The Dover College site is accessed via Red Lion Street. The site is affected by road traffic noise from the centre of Spalding and vehicles using Red Lion Street for parking, access and turning. The site location is shown below;

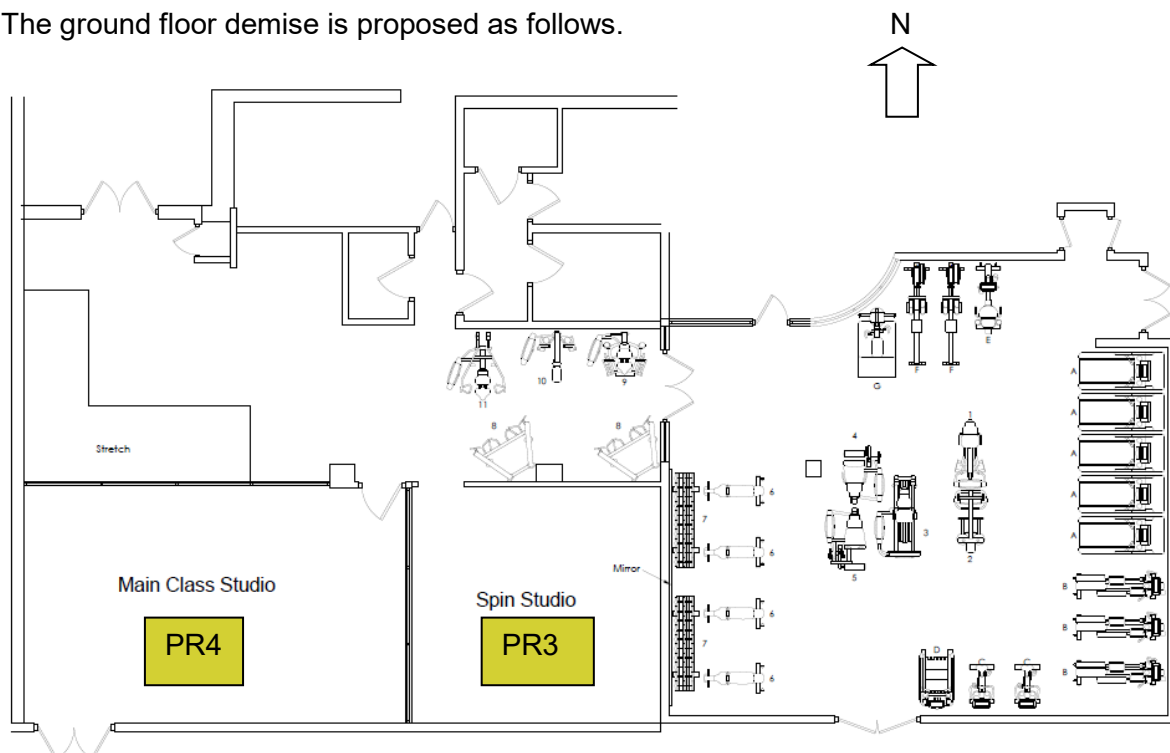


Street View:

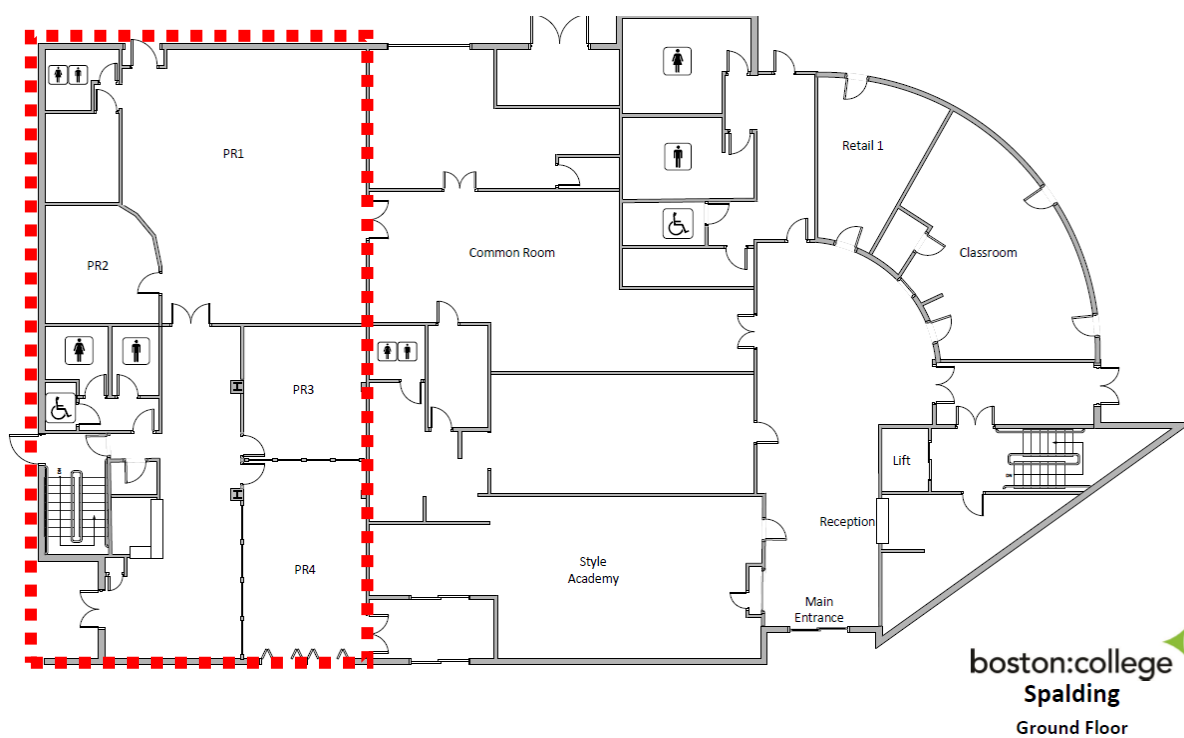


2.2 Proposed Development

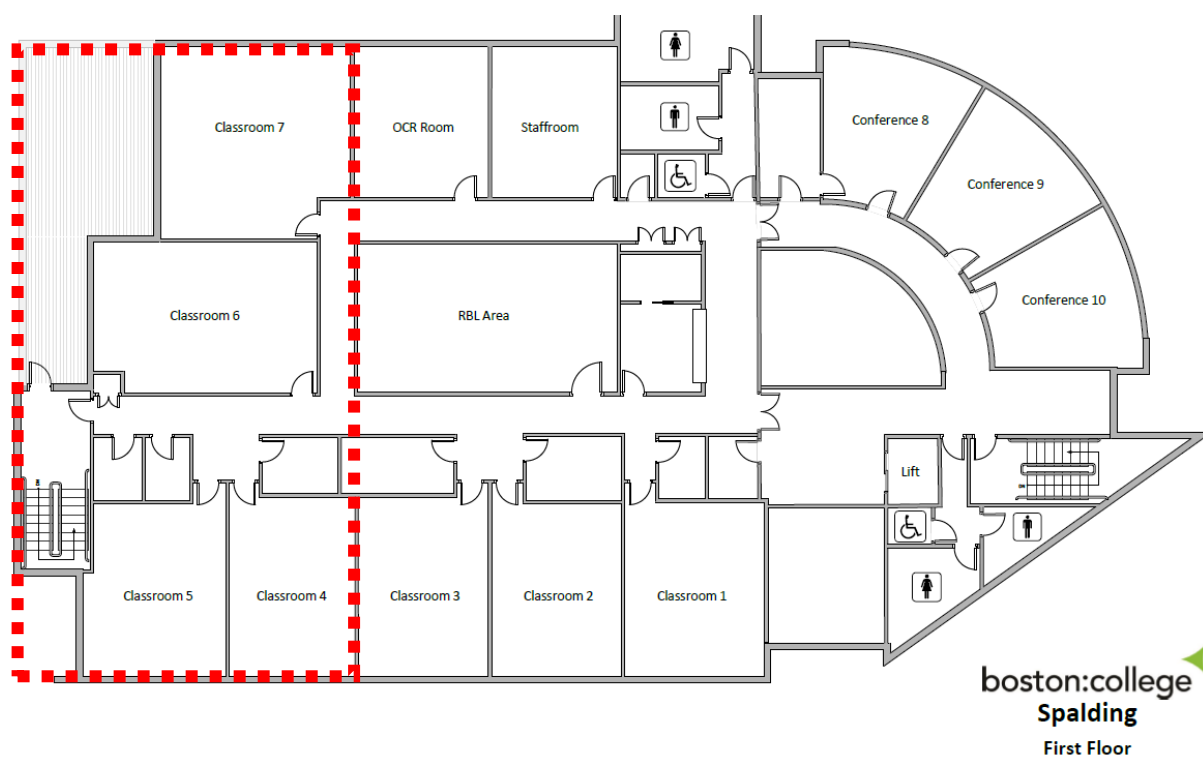
The ground floor demise to the north of the Boston College building will be taken over and operated as a temporary gym facility, while works to the town's leisure centre are on-going. The ground floor demise is proposed as follows.



Wider Ground Floor Plan:



First Floor Plan:



2.3 Noise Management Statement for the new temporary facility

Noise Management Statement – Planning Application for Change of Use

As part of our application to convert an existing learning space at Boston College into a leisure facility, we recognise the importance of responsible noise management. Our goal is to operate the space in a way that ensures minimal disruption to learners in the same building, as well as to nearby businesses and local residents.

Noise Control Measures:

1. Ambient Music in the Gym Area:

- Music in the gym will be played at a low, ambient volume during all opening hours.
- Ambient sound levels will be maintained at approximately 60–65 decibels (dB). This is similar to background music in a retail or café setting and is designed to be unobtrusive while providing an energising environment for users.
- This level of music is well below thresholds that would carry significantly beyond the space or disrupt neighbouring areas.

2. Music in Instructor-led Classes (Two Studios):

- Classes such as yoga, pilates, and fitness sessions will take place in two dedicated studios.
- Music during classes will be set at a level that allows instructors to speak clearly over it without needing microphones or amplification.
- The volume for these sessions will remain at approximately 65–70 dB, slightly higher than ambient gym music but still within a controlled range suitable for enclosed spaces.
- This level ensures clarity for participants while minimising sound transmission beyond the studios.

3. Studio Layout and Acoustic Considerations:

- The size, position, and internal design of the studios support effective sound containment.

4. Use of Matting to Reduce Sound Transmission:

3. Assessment Methodology

3.1 Policy

The National Planning Policy Framework (NPPF) sets out the general requirements for gaining planning permission. Comments regarding noise found within the document are as follows.

S15. Conserving and enhancing the natural environment

Planning policies and decisions should contribute to and enhance the natural and local environment by:

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

Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

a) Mitigate and reduce to a minimum, potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;

b) Identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason;

Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established.

Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed.

The NPPF directs us for further specific guidance on noise to the Noise Policy Statement for England (DEFRA March 2010) which gives three aims, which should be adhered to when considering a development:

Noise Policy Aims

Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- avoid significant adverse impacts on health and quality of life;
- mitigate and minimise adverse impacts on health and quality of life; and
- where possible, contribute to the improvement of health and quality of life.

Within the document the avoidance of impact on health and quality of life are discussed in the context of terminology used in toxicology as the excerpt from the document discusses below. There are several key phrases within the NPSE aims and these are discussed below.

“Significant adverse” and “adverse”

There are two established concepts from toxicology that are currently being applied to noise impacts, for example, by the World Health Organisation. They are:

NOEL – No Observed Effect Level

This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.

LOAEL – Lowest Observed Adverse Effect Level

This is the level above which adverse effects on health and quality of life can be detected.

Extending these concepts for the purpose of this NPSE leads to the concept of a significant observed adverse effect level.

SOAEL – Significant Observed Adverse Effect Level

This is the level above which, significant adverse effects on health and quality of life occur.

It is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times. It is acknowledged that further research is required to increase our understanding of what may

constitute a significant adverse impact on health and quality of life from noise. However, not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available.

The first aim of the Noise Policy Statement for England

Avoid significant adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.

The first aim of the NPSE states that significant adverse effects on health and quality of life should be avoided while also taking into account the guiding principles of sustainable development

The second aim of the Noise Policy Statement for England

Mitigate and minimise adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.

The second aim of the NPSE refers to the situation where the impact lies somewhere between LOAEL and SOAEL. It requires that all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also taking into account the guiding principles of sustainable development. This does not mean that such adverse effects cannot occur.

The third aim of the Noise Policy Statement for England

Where possible, contribute to the improvement of health and quality of life through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.

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

When considering the requirements for the proposed development, the development should demonstrate that aims of the NPSE have been followed, this is through the application of the

more suitable specific guidance on noise both affecting the developments and dealing with noise arising from it.

3.2 Noise Impact Assessment Overview

3.2.1 BS8233:2014 ‘Guidance on sound insulation and noise reduction for buildings’

The most applicable guidance which details desirable environmental noise conditions for a range of environments is BS 8233: 2014 ‘Guidance on sound insulation and noise reduction for buildings’ (BS 8233).

BS 8233:2014 – Guidance on Sound Insulation and Noise Reduction for Buildings provides recommendations for the control of noise in and around buildings. It suggests appropriate criteria and limits for different situations, 7.7.3.2 describes external noise criteria below.

7.7.3.2 Design criteria for external noise

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 $L_{Aeq,T}$ with an upper guideline value of 55 dB $L_{Aeq,T}$ 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.

Beyond the above, the noise emission from the demise main class studio has been measured and when adjusted pro-rata based on the noise management statement provided for the temporary gym by the South & East Lincolnshire Councils Partnership will be shown against the pre-existing hourly L_{Aeq} value for the worst case times of operation.

3.2.2 IEMA Guidelines for Environmental Noise Impact Assessment

PURPOSE OF THE GUIDELINES 1.2 These guidelines address the key principles of noise impact assessment and are applicable to all development proposals where noise effects are likely to occur. The guidelines provide specific support on how noise impact assessment fits within the Environmental Impact Assessment (EIA) process. They cover: • how to scope a noise assessment; • issues to be considered when defining the baseline noise environment; • prediction of changes in noise levels as a result of implementing development proposals; and • definition and evaluation of the significance of the effect of changes in noise levels (for use only where the assessment is undertaken within an EIA).	3.4 Care must be taken with the terminology used in a noise assessment. In this document, the following definitions apply. Noise Impact The difference in the acoustic environment before and after the implementation of the proposals (also known as the magnitude of change). This includes any change in noise level and in other characteristics/features, and the relationship of the resulting noise level to any standard benchmarks⁴⁴. Noise Effect The consequence of the noise impact. This may be in the form of a change in the annoyance caused, a change in the degree of intrusion or disturbance caused by the acoustic environment, or the potential for the change to alter the character of an area such that there is a perceived change in quality of life. This will be dependent on the receptor and its sensitivity. Significance of Effect The evaluation of the noise effect and, particularly if the noise impact assessment is part of a formal EIA, deciding whether or not that impact is significant⁴⁵.
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The IEMA Guidance discusses potential responses to varying orders of magnitude of noise impact both beneficial and adverse within the following table.

TABLE 7-7
GENERIC RELATIONSHIP BETWEEN NOISE IMPACT (MAGNITUDE) AND NOISE EFFECT
(MAGNITUDE + SENSITIVITY), INCLUDING THE EVALUATION OF EFFECT SIGNIFICANCE

MAGNITUDE (Nature of Impact)		DESCRIPTION OF EFFECT (on a specific sensitive receptor)	SIGNIFICANCE (as required within EIA)
Substantial	BENEFICIAL	Receptor perception = Marked change Causes a material change in behaviour and/or attitude, e.g. individuals begin to engage in activities previously avoided due to preceding environmental noise conditions. Quality of life enhanced due to change in character of the area.	More Likely to be Significant (Greater justification needed – based on impact magnitude and receptor sensitivities – to justify a non-significant effect) ↕ (Greater justification needed – based on impact magnitude and receptor sensitivities – to justify a significant effect) Less Likely to be Significant
Moderate		Receptor perception = Noticeable improvement Improved noise climate resulting in small changes in behaviour and/or attitude, e.g. turning down volume of television; speaking more quietly; opening windows. Affects the character of the area such that there is a perceived change in the quality of life.	
Slight		Receptor perception = Just noticeable improvement Noise impact can be heard, but does not result in any change in behaviour or attitude. Can slightly affect the character of the area but not such that there is a perceived change in the quality of life.	
Negligible		N/A = No discernible effect on the receptor	Not Significant
Slight	ADVERSE	Receptor perception = Non-intrusive Noise impact can be heard, but does not cause any change in behaviour or attitude, e.g. turning up volume of television; speaking more loudly; closing windows. Can slightly affect the character of the area but not such that there is a perceived change in the quality of life.	Less Likely to be Significant (Greater justification needed – based on impact magnitude and receptor sensitivities – to justify a significant effect) ↕ (Greater justification needed – based on impact magnitude and receptor sensitivities – to justify a non-significant effect) More Likely to be Significant
Moderate		Receptor perception = Intrusive Noise impact can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; closing windows. Potential for non-awakening sleep disturbance ⁸¹ . Affects the character of the area such that there is a perceived change in the quality of life.	
Substantial		Receptor perception = Disruptive Causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion. 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 character of the area.	
Severe		Receptor perception = Physically Harmful Significant 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.	Significant

Changes in environmental noise and the relationship to the magnitude of impact are given in the following tables:

TABLE 7-11 DEGREE OF EFFECT MATRIX

		IMPORTANCE/SENSITIVITY OF RECEPTOR			
		High	Medium	Low	Negligible
MAGNITUDE/SCALE OF CHANGE	Large	Very Substantial	Substantial	Moderate	None
	Medium	Substantial	Substantial	Moderate	None
	Small	Moderate	Moderate	Slight	None
	Negligible	None	None	None	None

TABLE 7-12 EFFECT DESCRIPTORS

Very Substantial	Greater than 10 dB LAeq change in sound level perceived at a receptor of great sensitivity to noise
Substantial	Greater than 5 dB LAeq change in sound level at a noise-sensitive receptor; or a 5 to 9.9 dB LAeq change in sound level at a receptor of great sensitivity to noise
Moderate	A 3 to 4.9 dB LAeq change in sound level at a sensitive or highly sensitive noise receptor; or a greater than 5 dB LAeq change in sound level at a receptor of some sensitivity
Slight	A 3 to 4.9 dB LAeq change in sound level at a receptor of some sensitivity
None/Not Significant	Less than 2.9 dB LAeq change in sound level and/or all receptors are of negligible sensitivity to noise or marginal to the zone of influence of the proposals

TABLE 7-14 IMPACT FROM THE CHANGE IN SOUND LEVELS

(Source HS2 Phase I Environmental Statement)

Long-term Impact Classification	Short-term Impact Classification	Sound level change dB LpAeqT (positive or negative) T = either 16hr day or 8hr night
Negligible	Negligible	≥ 0 dB and < 1 dB
	Minor	≥ 1 dB and < 3 dB
Minor	Moderate	≥ 3 dB and < 5 dB
Moderate	Major	≥ 5 dB and < 10 dB
Major		≥ 10 dB

The aim of the assessment is to ensure a negligible change in the baseline noise level.

Focus is applied on the use of the two studios within the gym demise on an hourly basis rather than a 16hr averaging period across the entire day, which has the potential to 'smooth out' noise impact over a shorter period by considering the whole 16hr daytime, it is more onerous to review a studio class in a worst case hour period which may occur during the day or in the evening hours of 06:30-21:00hrs.

In the context of the classrooms at 1st floor level, a class during 09:00-16:00hrs is considered, with predicted results, based on in-situ testing compared with the underlying ambient noise level within Classroom 4, which is directly above the main studio space.

3.2.3 World Health Organisation 'Guidelines for Community Noise'

World Health Organisation 'Guidelines for Community Noise' states that, in dwellings, the critical effects of noise are on sleep, annoyance and speech interference. According to this document, to protect the majority of people from being seriously annoyed during the daytime, the sound pressure level on balconies, terraces and outdoor living areas should not exceed 55 dB L_{Aeq} for a steady, continuous noise. To protect the majority of people from being moderately annoyed during the daytime, the outdoor sound pressure level should not exceed 50 dB L_{Aeq}.

The following noise limits for external amenity areas should be targeted.

Location	Desirable external ambient noise levels
External Amenity Area	50-55 dB L _{Aeq, T} ⁽¹⁾

(1) This is also referred to by BS 8233: 2014 'Guidance on sound insulation and noise reduction for buildings' and Pro PG: Planning & Noise 2017 'Professional Practice Guidance on Planning & Noise'.

4. Survey Method and Equipment

4.1 Survey

The noise survey was carried out between 19th and 20th June 2025 to measure representative noise levels at the site of the proposed development during a typical weekday period.

Noise measurements were made with a calibrated precision grade sound level meter which achieves the requirements of BS EN 61672:2003. The survey was carried out in accordance with the principles of BS 7445:1997 Parts 1-3, 'Description and Measurement of Environmental Noise', British Standard BS4142: 2014: Methods for rating and assessing industrial and commercial sound.

4.2 Equipment

- Norsonic precision grade sound level meter 140 serial No. 1407673.
- Norsonic Sound Calibrator 1251. Serial number 31326.
- Environmental wind shield
- Amplifier, pink noise source and Norsonic hemi dodecahedron speaker.

The sound level meter was field calibrated before and after the survey. No significant drift was noted between the two reference checks. The meter and calibrator both carry in date laboratory calibration to traceable standards which are available upon request.

4.3 Weather

During the survey, it was noted that the climatic conditions were stable during the whole measurement period with no occurrence of rain during the daytime period and typically low wind speeds of <5 m/s as measured using a kestrel 2500 weather meter whilst on site. Temperatures ranged from 26 degrees during the day to 14 degrees overnight. Conditions were considered conducive to environmental noise measurement.

5. Survey Results

The measurement survey at all monitoring locations comprised of consecutive measurement periods in terms of the most relevant standards and guidelines.

5.1 Environmental Noise Measurement Result Summary

The tables below show the period noise levels measured at all monitoring locations. These have subsequently been used as the basis for establishing the dominant noise levels across the site. The full set of survey data is available on request.

MP1 Continuous Logger Location (Adjacent to dwelling at 24 Red Lion Street)

Time Period	L _{Aeq}
06:30-07:00hrs	47.8
07:00-08:00hrs	47.7*
08:00-09:00hrs	54.4*
09:00-17:00hrs	52.8
17:00-18:00hrs	54.6
18:00-19:00hrs	53.4
19:00-20:00hrs	50.6
20:00-21:00hrs	48.0

* Removes samples containing high noise levels presumably from waiting or turning vehicles – taken as extraneous.

5.2 Measured Sound Insulation Values

Source / Receiver Location	D _w (Ctr)
PR4 to Classroom 4 via floor	59 (Ctr: -5) dB
PR4 to Style Academy via glazing	27 (Ctr: -1) dB
PR4 to Gym Reception Desk	25 (Ctr: -2) dB
PR4 to outside (at 2 metres)	47 (Ctr: -5) dB
PR4 to PR3 Spin Studio movable wall	21 (Ctr: -1) dB

5.3 Measured Summary Values

Status	L _{Aeq}	L _{Afmax}	L _{A90}
Source In PR4	103.1	107.5	101.2
Receiver in Hair Salon Lobby	77.3	78.6	76.9
Receiver in Hair Salon Wash Basin Area Via Window	60.7	62.2	59.8
Receiver in Gym Reception Area	79.1	81.1	78.6
Receiver in PR3 via moveable wall	83.3	84.5	82.3
Classroom No. 4 @ 1st Floor	50.8	53.1	49.8
Outside PR4 on Red Lion St	63.2	66.1	61.6
Outside main gym entrance doors closed	53.7	57.7	52.2
Outside main gym entrance - doors open (12s)	64.9	66.1	64.2
LB Classroom	23.4	28.5	22.2
LB Gym Reception	25.3	37.3	22.5
LB external to PR4	45.8	47.6	44.7
Lb external to main gym doors	43.2	45.7	42
Lb Hair Salon	55	63.6	49

Note. 'Lb' is the underlying ambient noise level.

Note. 1/3 octave data has been used in an analysis of the data, then returned to 1/1 octaves for summary comparison with underlying ambient noise levels.

6. Site Noise Impact Assessment

For this section, it is recommended that the individual calculations set out within Appendix 3 are viewed. These set out the sound insulation performance, activity noise and underlying ambient noise level in a range of locations visited. Each is discussed below.

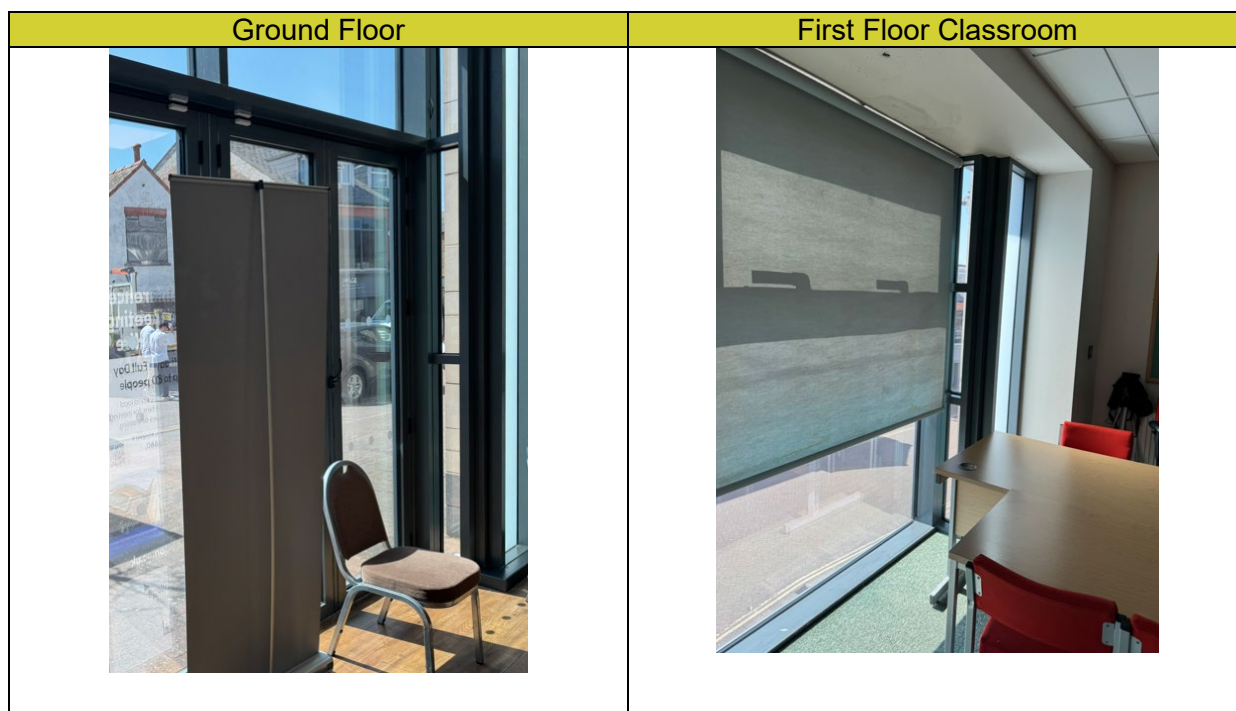
6.1 Occupational Noise Emission – PR4 to 1st Floor Classroom No. 4

The sound insulation performance between ground floor PR4 and classroom No. 4 above is $D_w + C_{tr} = 54\text{dB}$, which is a relatively high level of sound insulation.

Freq.	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	dBA
Expected	31.7	26.9	19.1	14.3	7.2	0.9	-6.5	23.2	23.3
Ambient	38.1	28.8	24.8	16.8	11.2	11.5	13	17.5	23.2

The expected sound level from the main class studio is approximately equal to the ambient sound level measured in the unoccupied classroom. Only one frequency is predicted to be above the baseline level.

Noise was noted, during the sound insulation test, travelling via the curtain walling elements in the classroom. Connected mullions and transoms exist at both ground and first floor as shown below.



Anecdotally, users of the classrooms have noted audible and recognisable noises from below within the rooms above the salon and PR4. However in the context of potential noise level change (IEMA), the potential impact expected is None/Not Significant, based on the noise level suggested in the Noise Management Statement of 70dBA.

6.2 Occupational Noise Emission – PR4 to Style Academy

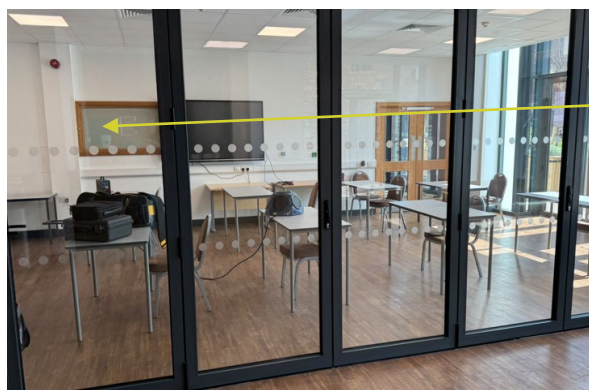
The sound insulation performance between ground floor PR4 and classroom No. 4 above is $D_w + C_{tr} = 26\text{dB}$, which is a low level of sound insulation, in the washbasin area of the salon there is a connecting window which was audibly the weaker element within the separating wall. The expected noise intrusion level within the salon using the studio noise level advised by the noise management statement is as follows.

Freq.	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	dBA
Expected	47.6	46.8	47.2	41.7	36.8	36.5	32	28.5	44.7
Ambient	48.6	43.9	45.8	53.4	51.8	43.5	43.4	38.3	55.2

There are minor increases at 125Hz and 250Hz as noted above, however the underlying ambient noise level when the salon is in use with its background music and activity is at a level where the overall incoming noise level is 10dB below the noise level that pre-exists within the space.

In the context of potential noise level change (IEMA), the potential impact expected is None/Not Significant, based on the noise level suggested in the Noise Management Statement of 70dBA, however in quiet periods within the salon, the studio may be faintly audible.

The window could be overclad with a timber frame and a secondary glazing pane to improve the level of sound insulation. However the double doors to the shared lobby are also weak in terms of transmission to the salon reception space and installation of acoustic seals could be considered.



Window to wash basin area

6.3 Occupational Noise Emission – PR4 to PR3 Spin Studio

A moveable wall links the two spaces and visible gaps are noted above and below the wall panels.



The sound insulation performance between ground floor PR4 and PR3 is $D_w + C_{tr} = 21\text{dB}$, which is a very low level of sound insulation. Use of studios simultaneously would be expected to be problematic, particularly should one use have significantly lower activity noise than the other. Scheduling of classes would be highly recommended.

Alternatively the wall could be removed or boarded over on both sides to create a temporary solid wall. Boards would need to extend from floor slab to soffit and 2x12.5mm soundbloc boards from British Gypsum would be initially recommended to both sides with a thin mineral fibre quilt within the cavity.

6.4 Occupational Noise Emission – PR4 to Outside

The sound insulation performance between ground floor PR4 and 2 metres outside of the building on Red Lion Street is $D_w + C_{tr} = 42\text{dB}$, which is a reasonable level of sound insulation.

When the advised noise level is overlaid against the sound insulation performance determined and ambient noise level externally, the following is noted;

Freq.	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	dBA
Expected	42.2	40.4	29.7	20.8	19.4	15	2.7	22	29.0
Ambient	52.4	49.7	48.5	43.8	39.5	35.3	30.5	21.2	46.0

It is highly unlikely that noise would be audible externally with the use of the main class studio at a noise level of 70dBA. This coupled with additional distance indicates that even commencing at 06:30hrs which is the quietest ambient noise level period noted (within the operating hours advised), the studio use is not expected to be audible.

Noise emission is seen to be substantially below the outdoor amenity criteria range of $L_{Aeq} = 50\text{-}55\text{dB}$ and in the context of potential noise level change (IEMA), the potential impact expected is None/Not Significant.

7. Conclusions

The impact of noise associated with the proposed Parkwood South Holland Temporary Gym facility propped for the ground floor demise within the Boston College building, in Spalding.

Throughout, the assessment has been undertaken with reference to British Standards, national & local policies and international guidance on noise impact.

Noise impact has been assessed with consideration to the National Planning Policy Framework and the Noise Policy Statement for England.

Following these policies, guidance from the WHO 'Guidelines for Community Noise' and *BS8233:2014 'Guidance on sound insulation and noise reduction for buildings'* and IEMA, have been used to confirm that 'significant adverse impacts on health and quality of life' are expected to be avoided as a result of the proposed development.

The development is expected operate at a noise level which is significantly below the prevailing ambient noise conditions in the area.

8. References

1. National Planning Policy Framework.
2. Noise Policy Statement for England.
3. WHO: 1999 '*Guidelines for Community Noise*'
4. BS8233:2014 "Guidance on sound insulation and noise reduction for buildings"
5. IEMA Noise Guidelines Second Edition

9. Glossary of Terms

Sound Pressure Level and the decibel (dB)

The ear can detect a wide range of pressure variations and in order simplify this, a logarithmic scale is used to convert the values into manageable numbers. The dB (decibel) is the logarithmic unit used to describe sound levels. The typical range of sound pressure levels is 0 dB (threshold of hearing) to 120 dB (threshold of pain). Subjective variations in noise levels range from 3dB which is considered the minimum perceptible change in steady state noise to an increase/decrease in noise level of 10 dB(A) corresponds to a doubling/halving of perceived loudness.

Frequency and hertz (Hz)

Frequency is a measure of the rate of fluctuation of a sound wave. The unit used is cycles per second given in Hz or kHz, where 1 kHz = 1000 Hz.

A-weighting

The ear is not equally sensitive to sound at all frequencies. It is less sensitive to sound at low and very high frequencies. To reflect this, linear values are subject to a filter called the 'A' weighting, this is typically built into sound level meters. Noise levels measured using the 'A' weighting are denoted dB(A) or L_A .

Sound Insulation Performance $D_w + C_{tr}$

Weighted Level Difference (D_w) a single integer number found by comparing the measured spectrum with the 'standard' curves in BS EN ISO 717 for airborne and impact insulation. The D_w value is where the curve meets the 500 Hz curve and the unfavourable deviation is 32 dB. D_w will be identical to $D_{nT,w}$, when $T = 0.5$ seconds.

According to BS 8233, weighted level difference is used to characterise the insulation between rooms in building as they are. Values cannot normally be compared with measurements made under other conditions.

Spectrum Adaption Terms (C and C_{tr}), the single number rating method defined in BS EN ISO 717 uses a standard reference curve to determine the weighted value of airborne sound insulation. The spectrum adaption terms C and C_{tr} may be used to take into account different source spectra as indicated in the standard.

C is the A-weighted pink noise spectrum. C_{tr} is the A-weighted urban traffic noise spectrum. C_{tr} is added to D_{nT,w} and D_w, or R_w measurements take into account low frequency noise.

Noise Indices

Environmental noise typically changes over time therefore it is not possible to represent the noise climate with a simple dB(A) value. A number of indices including statistical parameters, are normally used along with a sampling time (fast – *f*, slow – *s* or instantaneous – *i*) to assess environmental noise. The indices used in this report are described below.

L_{Aeq,T} This is the A-weighted 'equivalent continuous noise level' which is a logarithmic average of the total sound energy measured over a specified time period. In other words, L_{Aeq} is the level of a continuous noise which has the same total energy as the real fluctuating noise over a specific time period (given as T)

L_{Amax} This is the maximum A-weighted noise level recorded during the monitoring period.

L_{A90} This is the A-weighted noise level exceeded for 90% of the time period. L_{A90} is typically used as a measure of background noise.

Appendix 1 – ANC Membership



Pace Consult Ltd

has been elected by the Company to
Full Membership
of the Association

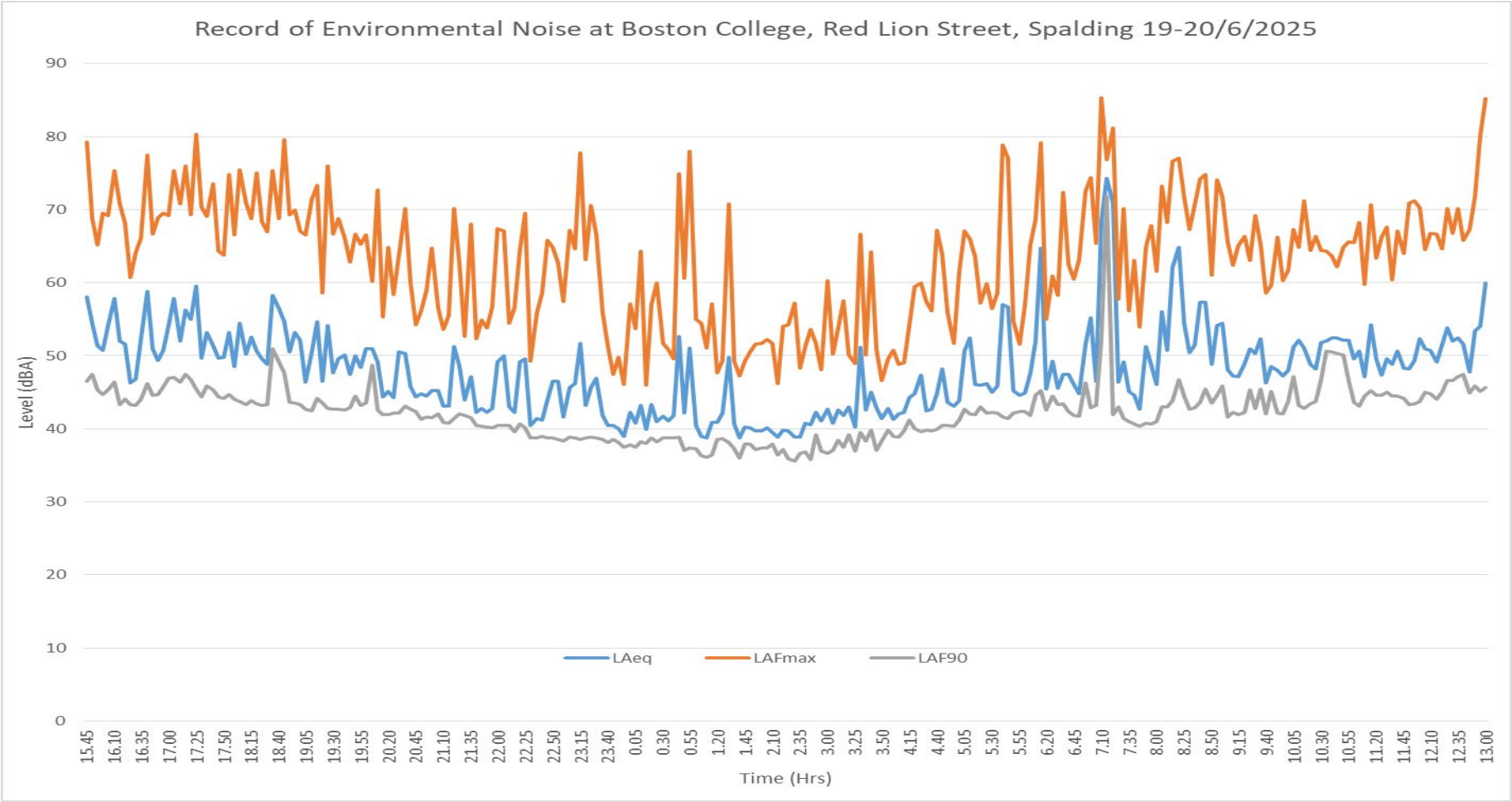
Date of Election December 2009

Signed 
President

(Company limited by guarantee registered in England No. 5289002)

This Certificate remains the property of the Association, returnable on demand

Appendix 2 – Environmental Noise Data Chart



Appendix 3 Calculations of Sound Insulation Performance and Noise Emission

PR4 Main Studio Classroom to Classroom 4

Status	Lfeq																								
	50 Hz	63 Hz	80 Hz	100 Hz	125 Hz	160 Hz	200 Hz	250 Hz	315 Hz	400 Hz	500 Hz	630 Hz	800 Hz	1.0 kHz	1.25 kHz	1.6 kHz	2.0 kHz	2.5 kHz	3.15 kHz	4.0 kHz	5.0 kHz	6.3 kHz	8.0 kHz	10.0 kHz	
Source In PR4	80.5	85.1	91.3	94.8	98.6	101.5	100.7	97.6	97.4	94.7	92.5	90.4	88.6	88.2	89.7	89.9	90.1	89.8	90.7	94	94.2	78.4	63.6	55.5	
Receiver in Classroom 4	47.4	47.2	56.1	54.3	56.8	56.2	49	47.4	41.4	39.3	41.5	37	30.3	28.3	28.2	28.4	28.5	27.5	28.2	29	17.9	16.3	15.9	29.5	
Level Diff	33.1	37.9	35.2	40.5	41.8	45.3	51.7	50.2	56	55.4	51	53.4	58.3	59.9	61.5	61.5	61.6	62.3	62.5	65	76.3	62.1	47.7	26	
Pure Gym Measured Leq,1-																									
	50	63	80	100	125	160	200	250	315	400	500	630	800	1K	1.25K	1.6K	2K	2.5K	3.15K	4K	5K	6.3K	8K	10K	
Typical Gym Music & Activity	57.6	61	65.2	59.3	66.2	66.6	65.5	67.1	64.9	62.1	61.1	64.1	62.9	61.8	60.7	58.9	57.5	56.8	54	53.9	52.3	52.3	52	49.1	
		67.1			69.8			70.7			67.4			66.7			62.6			58.2			56.1		
	50 Hz	63 Hz	80 Hz	100 Hz	125 Hz	160 Hz	200 Hz	250 Hz	315 Hz	400 Hz	500 Hz	630 Hz	800 Hz	1.0 kHz	1.25 kHz	1.6 kHz	2.0 kHz	2.5 kHz	3.15 kHz	4.0 kHz	5.0 kHz	6.3 kHz	8.0 kHz	10.0 kHz	Dw
Measured Level Diff	33.1	37.9	35.2	40.5	41.8	45.3	51.7	50.2	56	55.4	51	53.4	58.3	59.9	61.5	61.5	61.6	62.3	62.5	65	76.3	62.1	47.7	26	59 (C: -2; C
Typical Gym Music & Activity	57.6	61	65.2	59.3	66.2	66.6	65.5	67.1	64.9	62.1	61.1	64.1	62.9	61.8	60.7	58.9	57.5	56.8	54	53.9	52.3	52.3	52	49.1	
Result in Classroom 4 above	24.5	23.1	30	18.8	24.4	21.3	13.8	16.9	8.9	6.7	10.1	10.7	4.6	1.9	-0.8	-2.6	-4.1	-5.5	-8.5	-11.1	-24	-9.8	4.3	23.1	
Ambient in Classroom 4	35.5	31.4	32	26.3	22.7	21.6	22.7	19	16	13.2	11.6	11	6.7	5.9	6.7	6.3	6.3	7.4	7.5	8.2	9	9.6	10.7	15.5	
Excess over Ambient Noise	-11	-8.3	-2	-7.5	1.7	-0.3	-8.9	-2.1	-7.1	-6.5	-1.5	-0.3	-2.1	-4	-7.5	-8.9	-10.4	-12.9	-16	-19.3	-33	-19.4	-6.4	7.6	
	Freq.	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	dBA															
	Expected	31.7	26.9	19.1	14.3	7.2	0.9	-6.5	23.2	23.3															
	Ambient	38.1	28.8	24.8	16.8	11.2	11.5	13	17.5	23.2															

PR4 Main Class Studio to 2metres External on Red Lion Street

Status	Lf eq																							
	50 Hz	63 Hz	80 Hz	100 Hz	125 Hz	160 Hz	200 Hz	250 Hz	315 Hz	400 Hz	500 Hz	630 Hz	800 Hz	1.0 kHz	1.25 kHz	1.6 kHz	2.0 kHz	2.5 kHz	3.15 kHz	4.0 kHz	5.0 kHz	6.3 kHz	8.0 kHz	10.0 kHz
Source In PR4	80.5	85.1	91.3	94.8	98.6	101.5	100.7	97.6	97.4	94.7	92.5	90.4	88.6	88.2	89.7	89.9	90.1	89.8	90.7	94	94.2	78.4	63.6	55.5
Receiver Outside PR4	53	59	67.1	64.4	70.3	71	59.9	57.8	52.6	47.4	46.1	44.2	40.9	41.6	42.1	43.7	41.3	40.4	37.9	37.4	26	24.2	24.4	27.8
Level Diff	27.5	26.1	24.2	30.4	28.3	30.5	40.8	39.8	44.8	47.3	46.4	46.2	47.7	46.6	47.6	46.2	48.8	49.4	52.8	56.6	68.2	54.2	39.2	27.7
Pure Gym Measured Leq,1-																								
	50	63	80	100	125	160	200	250	315	400	500	630	800	1K	1.25K	1.6K	2K	2.5K	3.15K	4K	5K	6.3K	8K	10K
Typical Gym Music & Activity 71dBA	57.6	61	65.2	59.3	66.2	66.6	65.5	67.1	64.9	62.1	61.1	64.1	62.9	61.8	60.7	58.9	57.5	56.8	54	53.9	52.3	52.3	52	49.1
		67.1			69.8			70.7			67.4			66.7			62.6			58.2			56.1	
	50 Hz	63 Hz	80 Hz	100 Hz	125 Hz	160 Hz	200 Hz	250 Hz	315 Hz	400 Hz	500 Hz	630 Hz	800 Hz	1.0 kHz	1.25 kHz	1.6 kHz	2.0 kHz	2.5 kHz	3.15 kHz	4.0 kHz	5.0 kHz	6.3 kHz	8.0 kHz	10.0 kHz
Measured Level Diff	27.5	26.1	24.2	30.4	28.3	30.5	40.8	39.8	44.8	47.3	46.4	46.2	47.7	46.6	47.6	46.2	48.8	49.4	52.8	56.6	68.2	54.2	39.2	27.7
Typical Gym Music & Activity	57.6	61	65.2	59.3	66.2	66.6	65.5	67.1	64.9	62.1	61.1	64.1	62.9	61.8	60.7	58.9	57.5	56.8	54	53.9	52.3	52.3	52	49.1
Result in Outside PR4	30.1	34.9	41	28.9	37.9	36.1	24.7	27.3	20.1	14.8	14.7	17.9	15.2	15.2	13.1	12.7	8.7	7.4	1.2	-2.7	-15.9	-1.9	12.8	21.4
Ambient On Red Lion St	49.8	46.8	44.9	46.8	42.3	44.4	42.3	45.6	42.3	40.8	38.6	36.8	36.1	34.5	33.1	32.3	29.9	28.7	27.6	25.4	23	18.1	15.6	14.8
Excess over Ambient Noise	-19.7	-11.9	-3.9	-17.9	-4.4	-8.3	-17.6	-18.3	-22.2	-26	-23.9	-18.9	-20.9	-19.3	-20	-19.6	-21.2	-21.3	-26.4	-28.1	-38.9	-20	-2.8	6.6
	Freq.	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	dBA														
	Expected	42.2	40.4	29.7	20.8	19.4	15	2.7	22	29.0														
	Ambient	52.4	49.7	48.5	43.8	39.5	35.3	30.5	21.2	46.0														

PR4 Main Class Studio to Style Academy Salon

Status	Lfeq																							
	50 Hz	63 Hz	80 Hz	100 Hz	125 Hz	160 Hz	200 Hz	250 Hz	315 Hz	400 Hz	500 Hz	630 Hz	800 Hz	1.0 kHz	1.25 kHz	1.6 kHz	2.0 kHz	2.5 kHz	3.15 kHz	4.0 kHz	5.0 kHz	6.3 kHz	8.0 kHz	10.0 kHz
Source In PR4	80.5	85.1	91.3	94.8	98.6	101.5	100.7	97.6	97.4	94.7	92.5	90.4	88.6	88.2	89.7	89.9	90.1	89.8	90.7	94	94.2	78.4	63.6	55.5
Receiver in Hair Salon Lobby	60.2	64.9	72.2	76.9	74.7	77.2	80.2	71.3	71.9	70	67.8	63.1	58.3	58.6	60	61.5	63.8	66	66	66.8	66	49.6	36.1	29.5
Level Diff	20.3	20.2	19.1	17.9	23.9	24.3	20.5	26.3	25.5	24.7	24.7	27.3	30.3	29.6	29.7	28.4	26.3	23.8	24.7	27.2	28.2	28.8	27.5	26
Pure Gym Measured Leq,1-																								
	50	63	80	100	125	160	200	250	315	400	500	630	800	1K	1.25K	1.6K	2K	2.5K	3.15K	4K	5K	6.3K	8K	10K
Typical Gym Music & Activity	57.6	61	65.2	59.3	66.2	66.6	65.5	67.1	64.9	62.1	61.1	64.1	62.9	61.8	60.7	58.9	57.5	56.8	54	53.9	52.3	52.3	52	49.1
		67.1			69.8			70.7			67.4			66.7			62.6			58.2			56.1	
	50 Hz	63 Hz	80 Hz	100 Hz	125 Hz	160 Hz	200 Hz	250 Hz	315 Hz	400 Hz	500 Hz	630 Hz	800 Hz	1.0 kHz	1.25 kHz	1.6 kHz	2.0 kHz	2.5 kHz	3.15 kHz	4.0 kHz	5.0 kHz	6.3 kHz	8.0 kHz	10.0 kHz
Measured Level Diff	20.3	20.2	19.1	17.9	23.9	24.3	20.5	26.3	25.5	24.7	24.7	27.3	30.3	29.6	29.7	28.4	26.3	23.8	24.7	27.2	28.2	28.8	27.5	26
Typical Gym Music & Activity	57.6	61	65.2	59.3	66.2	66.6	65.5	67.1	64.9	62.1	61.1	64.1	62.9	61.8	60.7	58.9	57.5	56.8	54	53.9	52.3	52.3	52	49.1
Result in Hair Salon	37.3	40.8	46.1	41.4	42.3	42.3	45	40.8	39.4	37.4	36.4	36.8	32.6	32.2	31	30.5	31.2	33	29.3	26.7	24.1	23.5	24.5	23.1
Ambient in Hair Salon	48.4	32.1	31.4	42.8	32.8	35.5	39.7	42.1	41.1	44	49.3	50.3	50.4	43.5	43.1	38.7	38.3	39.1	36.9	38	40.2	36.3	32.1	29.4
Excess over Ambient Noise	-11.1	8.7	14.7	-1.4	9.5	6.8	5.3	-1.3	-1.7	-6.6	-12.9	-13.5	-17.8	-11.3	-12.1	-8.2	-7.1	-6.1	-7.6	-11.3	-16.1	-12.8	-7.6	-6.3
Freq.	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	dBA															
Expected	47.6	46.8	47.2	41.7	36.8	36.5	32	28.5	44.7															
Ambient	48.6	43.9	45.8	53.4	51.8	43.5	43.4	38.3	55.2															

Appendix 4 Gym Noise Data

Measured L _{max,f} Noise Spectra, dB re 2x10 ⁻⁵ Pa	20	31.5	40	50	63	80	100	125	160	200	250	315	400	500	630	800	1K	1.25K	1.6K	2K	2.5K	3.15K	4K	5K	6.3K	8K	10K
Studio Music & Activity	63.2	73.7	72.5	73	74	79.4	84.8	87.5	89.1	92	89.8	90.8	94.8	89.8	87.6	90.1	95.8	99.4	93	95.4	86.6	90.1	86.2	83.1	80	77.1	76.2
					81.2			92.2			95.7			96.6			101.3			97.7			92.2			82.9	
	Freq.	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	dba																	
		81.2	92.2	95.7	96.6	101.3	97.7	92.2	82.9	104.2																	
Typical Studio Music & Activity	81.1	74	69.6	75	88.8	85.9	84.7	87.5	85.8	82.5	79.6	77.9	87.5	87.1	88	86.6	85.8	85	80.7	78.4	76.2	71	74.5	73.9	70.4	68.5	69.6
					90.7			90.9			85.2			92.3			90.6			83.6			78.2			74.3	
	Freq.	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	dba																	
		90.7	90.9	85.2	92.3	90.6	83.6	78.2	74.3	93.9																	
Spin Class Music & Activity	73.3	76.4	74.1	76.7	88.3	88.4	87.2	87.6	90	83.4	84.3	80.2	84.5	84.7	83.7	81.6	77.6	82.7	85.4	77.5	78	77.6	77.6	76.5	75.2	69.1	68
					91.5			93.2			87.7			89.1			85.9			86.7			82			76.8	
	Freq.	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	dba																	
		91.5	93.2	87.7	89.1	85.9	86.7	82	76.8	92.5																	
Busy Main Gym	62	73.6	72.4	71.9	69.2	70.5	73.3	76	76.6	80.8	77.1	78.8	76.1	74.1	75.5	74.9	72.9	74.6	68.6	66.1	69.1	65.8	66.4	71.4	65.2	65.5	63.1
					75.4			80.3			83.9			80.1			79			72.9			73.4			69.5	
	Freq.	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	dba																	
		75.4	80.3	83.9	80.1	79	72.9	73.4	69.5	83.6																	
Measured Leq,1-minute Noise Spectra, dB re 2x10 ⁻⁵ Pa	20	31.5	40	50	63	80	100	125	160	200	250	315	400	500	630	800	1K	1.25K	1.6K	2K	2.5K	3.15K	4K	5K	6.3K	8K	10K
Typical Gym Music & Activity	55.3	58.4	55.6	57.6	61	65.2	59.3	66.2	66.6	65.5	67.1	64.9	62.1	61.1	64.1	62.9	61.8	60.7	58.9	57.5	56.8	54	53.9	52.3	52.3	52	49.1
					67.1			69.8			70.7			67.4			66.7			62.6			58.2			56.1	
	Freq.	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	dba																	
		67.1	69.8	70.7	67.4	66.7	62.6	58.2	56.1	71.1																	
Pure Gym Source Music & Activity L _{max,f} Noise Levels: Octave Band Data	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8kHz	dba																		
Studio Music & Activity (Zumba)	86	95	97	94	102	97	89	85	104.1																		
Spin Class Music & Activity	93	94	84	83	93	86	77	75	94.5																		
Busy Main Gym	76	83	82	80	77	72	73	70	82.6																		