

NOISE IMPACT ASSESSMENT & ACOUSTIC DESIGN REPORT

REPORT REFERENCE: **NCSL 1214**

ROCHDALE BOROUGH COUNCIL,
BROWNHILL LEARNING COMMUNITY,
DARNHILL SITE, SUTHERLAND ROAD,
HEYWOOD, OL10 3PY.

22ND AUGUST 2023.

ISSUE 1.

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1 INTRODUCTION

Noise Control Solutions Limited (NCSL) have been commissioned by Rochdale Borough Council to undertake a noise impact assessment for the proposed school extension at Brownhill Learning Community, Darnhill Site, Sutherland Road, Heywood, OL10 3PY. The current school has a capacity of 80 SEN students, with the proposed four-classroom extension allowing for an additional 40 SEN students.

The assessment is required in order to accompany the relevant planning application which is to be considered by Rochdale Borough Council.

This assessment also considers the internal acoustics of the proposed development, in accordance with Building Bulletin 93, which defines the requirements for sound insulation between rooms, ambient sound levels and reverberation times within new or upgraded school premises.

It is understood that no external plant is included within the proposed development.


Report prepared by..... Andrew Todd BA_(HONS) MSc MIOA C_{ENG}

2 COMPETENCE

This report has been prepared by Mr Andrew Todd, a corporate member of the Institute of Acoustics, a holder of a MSc in Acoustics and a Chartered Engineer registered with the United Kingdom Engineering Council. Andrew has over 15 years of experience as an acoustic consultant/engineer working in various aspects of acoustics.

3 SUMMARY OF TERMS, DESCRIPTORS & QUANTITIES

Within this report, several acoustic descriptors and quantities are referred to. Due to their specialised nature, the following summary is provided.

DECIBELS (dB): Ten times the logarithm (base 10) of the ratio between a measured quantity and a reference quantity. For sound pressure levels defined within this report, the reference quantity is 20 Micropascals (μPa).

A-WEIGHTING: The filtering of acoustic signals in order to provide a closer approximation to the human hearing response. Measurements with this weighting applied are denoted with “(A)”, for example, “dB(A)”.

NTH PERCENTILE NOISE LEVEL ($L_{AN,T}$): The A-weighted sound pressure level, in decibels, exceeded for N% of the measurement duration (T). This metric is generally used to assess background noise levels (L_{A90}) as it allows for the removal of non-constant noise sources, for example, passing vehicles. The subscript ‘T’ defines the measurement duration.

EQUIVALENT CONTINUOUS NOISE LEVEL ($L_{AEQ,T}$): The logarithmically averaged sound pressure level, in decibels, over the measurement duration (T) with A-weighting applied. The subscript ‘T’ defines the measurement duration.

FAST TIME WEIGHTING: The integration time constant of the measurement. Fast time weighting, denoted by the subscript ‘F’, integrates sound pressure levels over 0.125 seconds.

MAX LEVEL ($L_{AF\ MAX}$): The maximum reported RMS sound pressure level during a measurement period. The level is A-weighted and is calculated with a Fast time weighting.

DAY-TIME AND NIGHT-TIME PERIODS: Following guidance contained within BS4142, the day-time period is defined as 07:00 to 23:00 and the night-time period is defined as 23:00 to 07:00.

NOISE SENSITIVE RECEPTOR (NSR): A premises or area which is sensitive to noise disturbance. This is generally an existing, or future residential premises close to a proposed development.

SOUND POWER LEVEL (L_W): The sound energy radiated per unit time by a sound source, measured in Watts (W) on a decibel scale with a reference value of 10^{-12} W .

4 APPLICABLE LITERATURE

4.1 NATIONAL PLANNING POLICY FRAMEWORK

The National Planning Policy Framework (NPPF), updated in 2021, outlines the Government's planning policies for England and how they are expected to be applied. In respect of noise, the document states that:

Planning policies and decisions should also ensure that new development is appropriate for its location, taking into account the 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:

- *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.*
- *Identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.*

Additionally, the policy states that:

- *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.*
- *Planning conditions should be kept to a minimum and only imposed where they are necessary, relevant to planning and to the development to be permitted, enforceable, precise and reasonable in all other respects. Agreeing conditions early is beneficial to all parties involved in the process and can speed up decision-making. Conditions that are required to be discharged before development commences should be avoided, unless there is a clear justification*

4.2 NOISE POLICY STATEMENT FOR ENGLAND (NPSE)

Published in March 2010 by DEFRA, this document defines the Government's policy on noise. It incorporates the long-term vision of promoting good health and quality of life through the effective management of noise in the context of Government policy on sustainable development. The long-term vision of the NPSE is supported by the following aims:

- *Avoid significant adverse impacts on health and quality of life.*
- *Mitigate and minimise adverse impacts of health and quality of life.*
- *Where possible, contribute to the improvement of health and quality of life.*

This document also defines three categories relating to noise impact:

- **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 EFFECT LEVEL.** This is the level above which adverse effects on health and quality of life can be detected.
- **SOAEL – SIGNIFICANT OBSERVED ADVERSE EFFECT LEVEL.** This is the level above which significant adverse effects on health and quality of life occur.

4.3 PLANNING PRACTICE GUIDANCE

Further detail is provided within the Planning Practice Guidance (PPG) regarding how the effect levels, set out within NPSE, can be recognised and the associated concern arising from each.

At the lowest extreme, when noise is not perceived to be present, there is by definition no effect. As the noise exposure increases, it will cross the 'no observed effect' level. However, the noise has no adverse effect so long as the exposure does not cause any change in behavior, attitude or other physiological responses of those affected by it. The noise may slightly affect the acoustic character of an area but not to the extent

there is a change in quality of life. If the noise exposure is at this level no specific measures are required to manage the acoustic environment.

As the exposure increases further, it crosses the 'lowest observed adverse effect' level boundary above which the noise starts to cause small changes in behavior and attitude, for example, having to turn up the volume on the television or needing to speak more loudly to be heard. The noise therefore starts to have an adverse effect and consideration needs to be given to mitigating and minimising those effects (taking account of the economic and social benefits being derived from the activity causing the noise).

Increasing noise exposure will at some point cause the 'significant observed adverse effect' level boundary to be crossed. Above this level the noise causes a material change in behavior such as keeping windows closed for most of the time or avoiding certain activities during periods when the noise is present. If the exposure is predicted to be above this level the planning process should be used to avoid this effect occurring, for example through the choice of sites at the plan-making stage, or by use of appropriate mitigation such as by altering the design and layout. While such decisions must be made taking account of the economic and social benefit of the activity causing or affected by the noise, it is undesirable for such exposure to be caused.

At the highest extreme, noise exposure would cause extensive and sustained adverse changes in behavior and / or health without an ability to mitigate the effect of the noise. The impacts on health and quality of life are such that regardless of the benefits of the activity causing the noise, this situation should be avoided.

Table 1 summarises the noise exposure hierarchy.

Response		Example of Outcomes	Increasing Effect Level	Action
No Observed Effect Level				
Not Noticeable	No Effect		No Observed Effect	No
				Specific Measures Required

Response	Example of Outcomes	Increasing Effect Level	Action
No Observed Adverse Effect Level			
Present & Not Intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life	No Observed Adverse Effect	No Specific Measures Required
Lowest Observed Adverse Effect Level			
Present & Intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.	Observed Adverse Effect	Mitigate & Reduce to a Minimum
Significant Observed Adverse Effect Level			
Present & Disruptive	The noise causes a material change in behaviour, attitude or other physiological response, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Effect Level	Avoid
Present & Very Disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

TABLE 1 – NOISE EXPOSURE HIERARCHY

4.4 BUILDING BULLETIN 93

This Standard relates to the building and modification of school buildings and became mandatory with the introduction of Approved Document E of the Building Regulations.

Any new schools, extensions or redevelopments must be designed in accordance with Building Bulletin 93 (BB93). Temporary buildings which are not intended to remain in place for more than 28 days, are exempt.

Sound insulation between rooms, ambient noise levels within rooms, and reverberation times within rooms must all meet specific criteria depending on the intended use of the room and adjacent rooms.

5 LOCATION

5.1 SITE LOCATION

The development in question is located at Brownhill Learning Community, Darnhill Site, Sutherland Road, Heywood, OL10 3PY, (reference 'D1'). This is an existing SEN school located within a predominantly residential area, however, there is a large industrial area 150m to the South of the development.

The current school has capacity for 80 students. The proposed four-classroom extension will increase that capacity to 120 students.

It is also noted that the proposed development also includes a small group room within each classroom and an access corridor.

5.2 SITE PLAN

The proposed layout of the school extension is shown below in Figure 1.

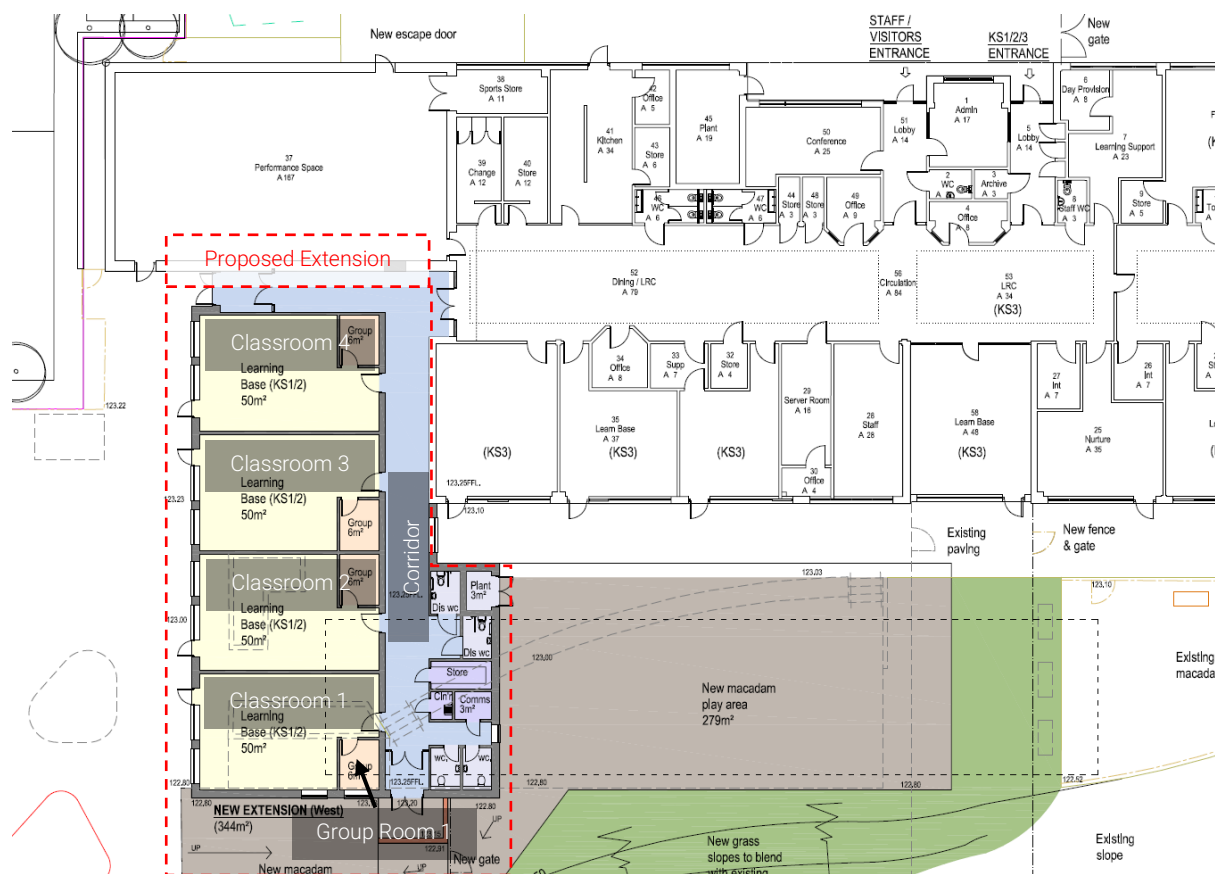


FIGURE 1 – PROPOSED SITE LAYOUT

5.3 MEASUREMENT LOCATIONS

Ambient sound level measurements detailed within this report were taken using an outdoor microphone positioned at the proposed extension location, at a distance of >3.5m from the existing façade and at a height of 1.5m.

Location Reference	Location Description	Measured Values
ML1	Proposed Extension Location	Ambient Sound Level (L_{Aeq})

TABLE 2 - MEASUREMENT LOCATIONS

5.4 LOCAL AREA MAP

A map of the local area is shown below in Figure 2.

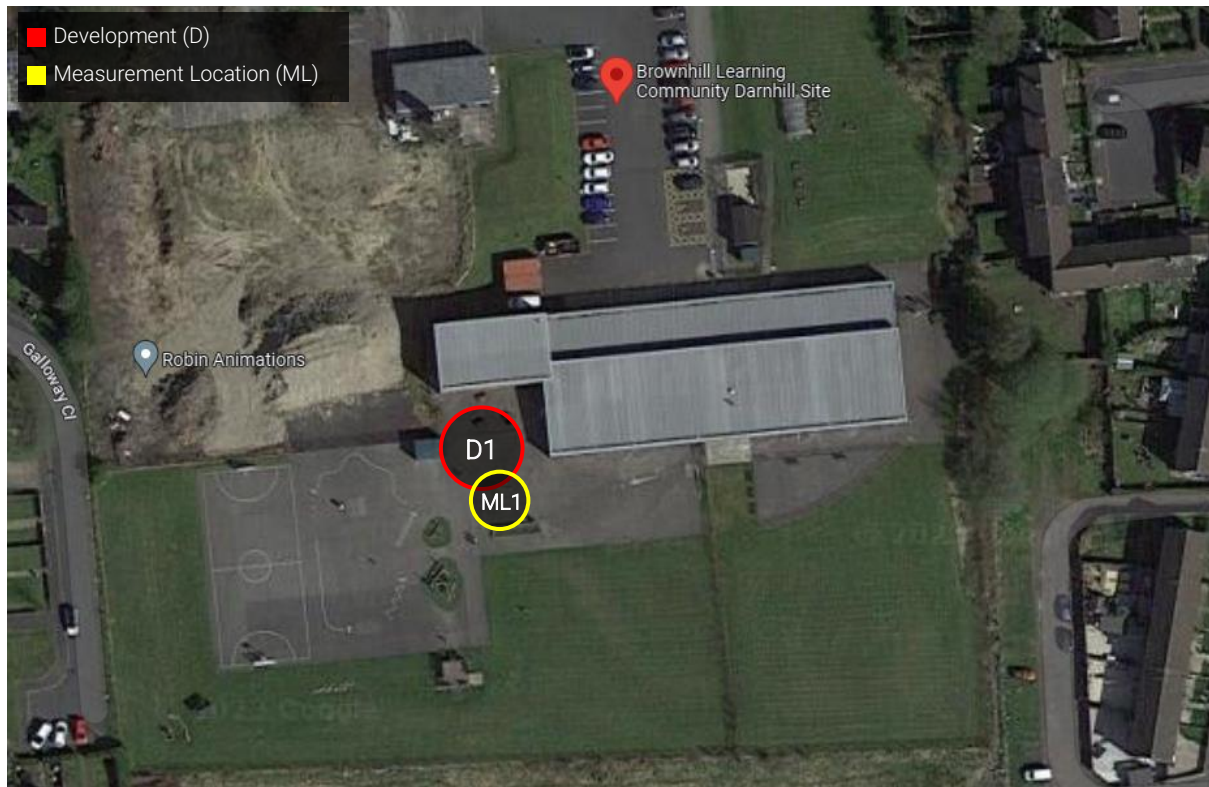


FIGURE 2 - LOCAL AREA MAP

5.5 SUBJECTIVE APPRAISAL OF THE EXISTING ACOUSTIC ENVIRONMENT

During a site visit on 28th July 2023, a subjective assessment of the existing acoustic environment was conducted by NCSL. At the proposed development location, the residual sound is made up of noise from local residents, vehicles, the nearby industrial area and aircraft flyovers.

6 EQUIPMENT & MEASUREMENT CONDITIONS

6.1 EQUIPMENT DETAILS

All measurements detailed within this report relating to the assessment of noise levels were made using a Class 1 NTi Audio XL2 sound level meter (serial number A2A-19038-E0). Field calibration of the meter was conducted using a Class 1 Brüel & Kjær Type 4230 94dB acoustic calibrator (serial number 1275784). Pre and post measurement sensitivity checks were conducted and showed no significant deviation to the nominal sound level meter sensitivity of 40.2mV/Pa or reference signal levels.

Details of these tests are documented in Table 3.

Test Reference	dB Level	Sensitivity	Comments
Pre-test calibration	93.9dB	40.2 mV/Pa	NA
Post-test check	93.9dB	40.2 mV/Pa	No significant variance

TABLE 3 - FIELD CALIBRATION DETAILS (S/N A2A-19038-E0)

All equipment is calibrated in accordance with IEC 61672-3, IEC 61260 and BS EN 60942:2003 where applicable. Calibration certificates are available upon request.

6.2 GROUND CONDITIONS

Ground conditions at ML1 consist of concrete playground and grassed areas. The ground was dry throughout the survey period.

6.3 WEATHER CONDITIONS

Weather conditions during survey measurements were clement and dry. A maximum wind speed of 2.7 ms⁻¹ was recorded.

Further details of weather conditions during this survey measurement are shown in Table 4.

Parameter	Survey Start	Survey End
Barometric Pressure	1004 mbar	1002 mbar
Temperature	21° Celsius	20° Celsius
Wind Velocity	2.7 ms ⁻¹	2.4 ms ⁻¹
Cloud Cover	50%	50%

TABLE 4 - ENVIRONMENTAL CONDITIONS

7 ACOUSTIC MEASUREMENTS & DEFINED SOUND LEVELS

7.1 AMBIENT SOUND LEVEL

The ambient sound level defines the total sound pressure level in a specific location at a specific time, generally composed of acoustic radiation from several sources. Measurements of ambient sound level take the form of an A-weighted equivalent continuous sound pressure level ($L_{Aeq,T}$). This metric logarithmically averages the observed sound level over the measurement period.

In the case of this noise assessment, the ambient sound level has been measured during the school holiday period. This allows the quantification of the sound level likely to be generated as a result of all other sources contributing to the acoustic environment at D1.

These measurements were taken at ML1.

The ambient sound level has been measured as an equivalent continuous A-weighted sound pressure level ($L_{Aeq,T}$) logged at 15-minute intervals. These discrete logged values have been logarithmically averaged over a measurement time interval of 7-hours between 0815hrs, 28th July 2023 and 1515hrs, 28th July 2023. This time interval is believed to be representative of the ambient sound level during the proposed school operating hours.

In this case, the day-time ambient sound level has been measured to be 50dB $L_{Aeq, 7\text{-hours}}$. This level is considered to be representative of the day-time ambient sound level at D1 and has been used within this report.

The resulting overall SPL and octave-band ambient sound levels are shown in Figures 3 and 4 respectively.

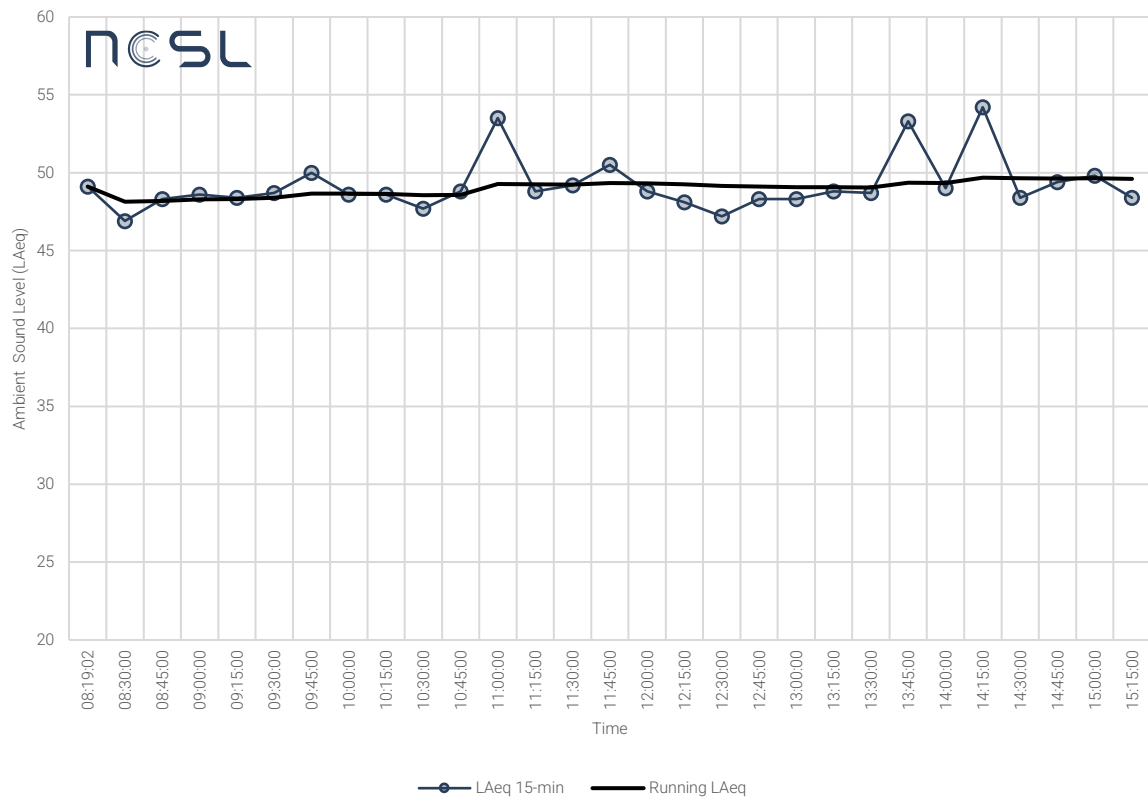


FIGURE 3 – OVERALL SPL AMBIENT SOUND LEVEL

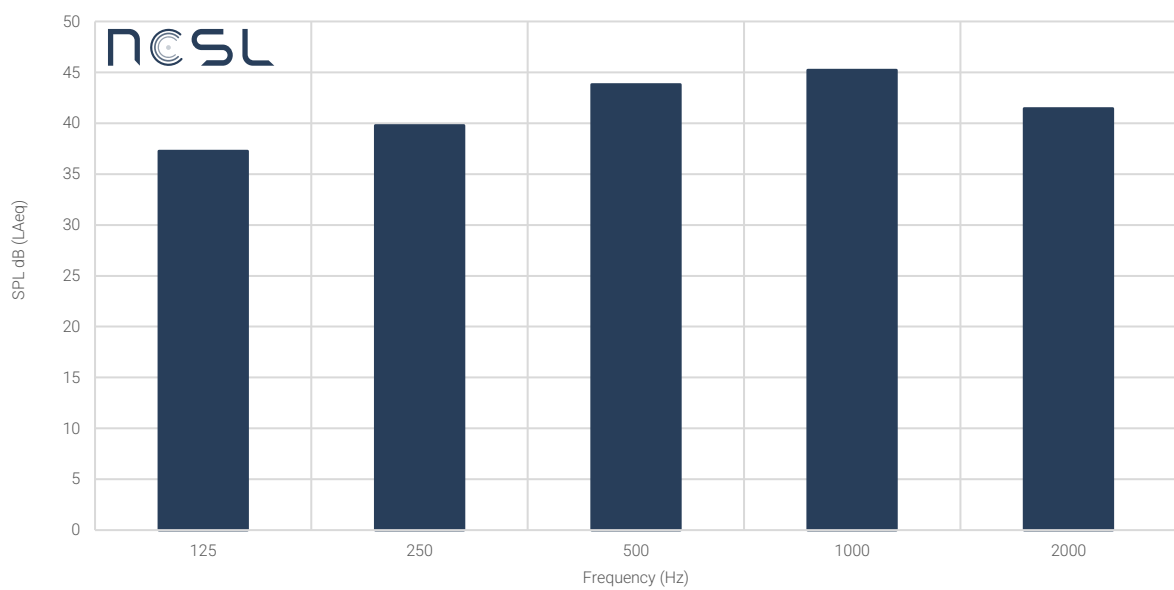


FIGURE 4 - OCTAVE-BAND AMBIENT SOUND LEVEL

The octave-band ambient sound levels are summarised in Table 5 below.

Frequency	125Hz	250Hz	500Hz	1kHz	2kHz	Sum
SPL (L _{Aeq} , 7hrs)	37.2	39.8	43.8	45.2	41.4	49.3

TABLE 5 - OCTAVE-BAND AMBIENT SOUND LEVEL (TABULATED)

8 INDOOR AMBIENT SOUND LEVELS

The proposed development comprises four new classrooms, each with a small group room, and a new corridor area. As the proposed classrooms are designated for use by SEN students, it is suggested that the classrooms follow the requirements of BB93 relating to 'SEN Calming Rooms'. This room type requires an ambient noise level of 35dB $L_{Aeq,30mins}$.

In order to achieve this requirement, a design specification is provided, which has been calculated in conjunction with the measured ambient sound levels defined within Table 5.

The noise mitigation measures are based upon commonly used products and materials and are shown in this report as examples. Alternatives to the recommended products may be used, however, any alternatives must meet with, or exceed the sound attenuation requirements of those used within this assessment. The minimum product performance is given below in Table 6.

Mitigation	Sound Reduction (dB)				
	125Hz	250Hz	500Hz	1000Hz	2000Hz
External Wall (Ext Brick, 50mm Cavity w Insulation, Int Block) ^[1]	47	47	49	59	69
Timber Doors ^[2]	21	18	22	24	30
Roof Insulated Panel (Kingspan KS1000 RW80) ^[3]	18	20	24	20	29
Glazing 4/6-12/4 (Pilkington) ^[4]	21	17	25	35	37
Acoustic Trickle Vent Greenwood 2500EAW.AC1 (Assumed 1 per Window) ^[5]	39	38	29	47	43

TABLE 6 - NOISE MITIGATION REQUIREMENTS

[1] Based upon calculated sound insulation performance via software modelling (INSUL 9.1) See Appendix B.

[2] As per Sound Research Laboratories (SRL) Ltd – Noise Control in Industry – Third Edition.

[3] As per Kingspan roof cladding brochure.

[4] As per Pilkington glazing brochure.

[5] As per Greenwood acoustic trickle ventilation brochure.

It is assumed that the external wall construction will consist of external brick and internal block in order to match the existing school façade. In addition, it is assumed that the roof will consist of an insulated panel system and that windows will have a height of 1m, similar to that of the existing classrooms.

The expected noise levels within the proposed classrooms, corridor and Group Room 1 (which has an external façade) are shown in Table 7 below. The calculations have been conducted in accordance with the methodology set out in BS8233. These calculations assume that windows will be kept closed, with ventilation provided by acoustic trickle vents.

Ref.	Plot Reference	Room Reference	Predicted Internal Noise Levels	Mitigation Requirements	
			Daytime L_{Aeq}	Vents	Glazing
1	Brownhill Extension	Classroom 1	31	Greenwood 2500EAW.AC1	4/6-12/4 (Pilkington)
2	Brownhill Extension	Classroom 2	31	Greenwood 2500EAW.AC1	4/6-12/4 (Pilkington)
3	Brownhill Extension	Classroom 3	31	Greenwood 2500EAW.AC1	4/6-12/4 (Pilkington)
4	Brownhill Extension	Classroom 4	31	Greenwood 2500EAW.AC1	4/6-12/4 (Pilkington)
5	Brownhill Extension	Classroom 1 - Group Room	32	Greenwood 2500EAW.AC1	4/6-12/4 (Pilkington)
6	Brownhill Extension	Corridor	17	No Vent	No Window

TABLE 7 – NOISE BREAK-IN SUMMARY

The noise mitigation measures utilise passive trickle vents which allow for the free movement of air whilst minimising noise break-in. However, it is recommended that the ventilation requirements of all rooms are checked with an appropriate specialist. If acoustic trickle vents are not able to provide sufficient air-flow to the rooms, a mechanical ventilation system may also be employed in order to meet the required indoor ambient sound levels.

This assessment has shown that the internal noise levels required by BB93 are likely to be met with the installation of the mitigation measures set out in Table 6.

Full details of the noise break-in calculations are shown in Appendix C.

9 SOUND INSULATION

9.1 SOUND INSULATION BETWEEN CLASSROOMS

As per the guidance provided within BB93, the sound insulation performance of partitions separating 'SEN Calming' classrooms should be a minimum of 55dB $D_{nT,w}$ when measured in accordance with BS EN ISO 717-1.

It is understood that a masonry separating wall construction is preferred in relation to the separating wall structure between classrooms. It is therefore recommended that the construction detail below, as per BS8233 & Robust Details E-WM-18, is used:

- Render (wet plaster)
- Dense Aggregate Blockwork (1850 to 2300 kg/m³)
- Minimum 100mm Cavity with "Tie Type A".
- Dense Aggregate Blockwork (1850 to 2300 kg/m³)
- Render (wet plaster)

Further details are shown in Figure 5.

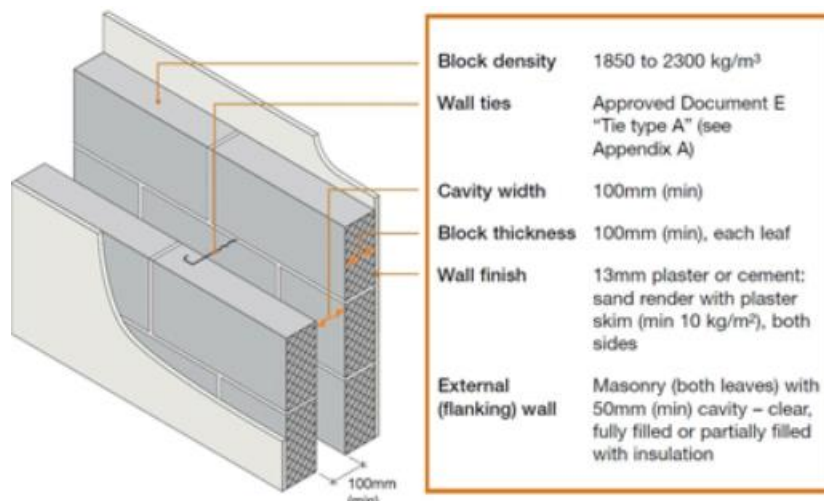


FIGURE 5 - E-WM-18 WALL SPECIFICATION

The separating wall structure should extend to the underside of the roof structure in order to minimise flanking sound transmission. In addition, an example of the junction detail with the external flanking wall is shown below in Figure 6.

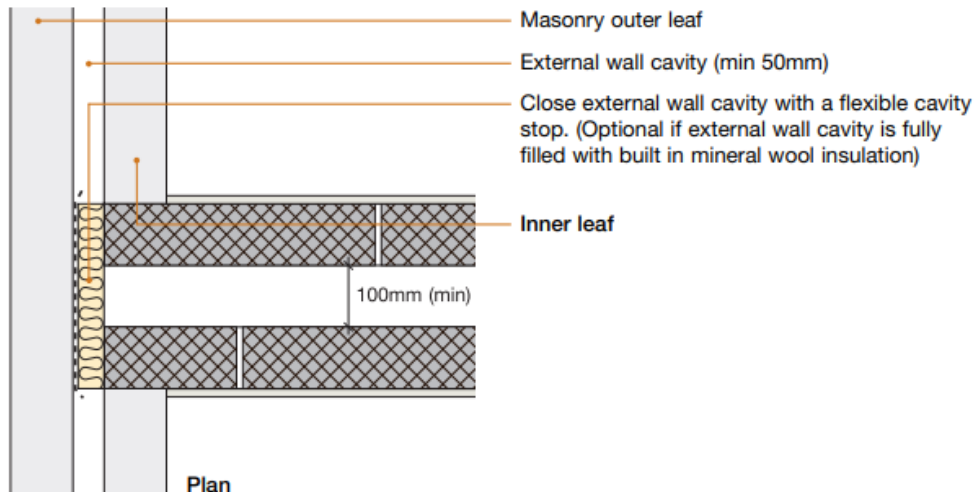


FIGURE 6 - JUNCTION DETAIL WITH EXTERNAL FLANKING WALL

9.2 SOUND INSULATION BETWEEN CLASSROOMS & CIRCULATION SPACES

As per the guidance provided within BB93, the separating walls between the proposed classrooms and the corridor / circulation space should provide a minimum sound insulation performance of 40dB R_w .

This would be expected to be achieved with a construction detail such as 100mm concrete block (medium to high density – 140kg/m² to 430kg/m²) with 12mm plaster / render on both sides. Further information is shown below in Figure 7. The separating wall structure should extend to the underside of the roof structure in order to minimise flanking sound transmission.

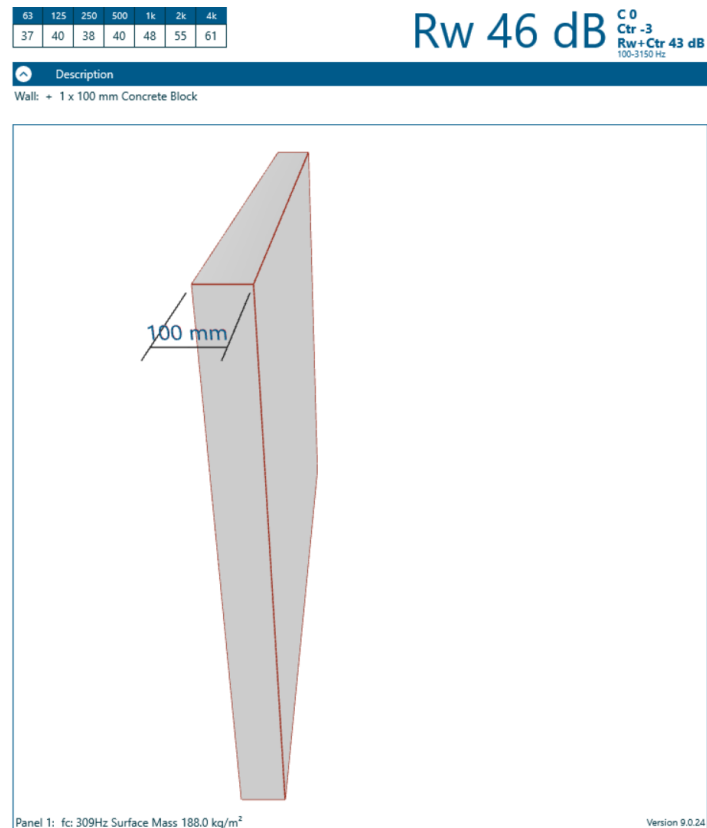


FIGURE 7 – SEPERATING WALL BETWEEN CLASSROOMS & CORRIDOR

In addition, doorsets between the proposed classrooms and the corridor / circulation space should provide a minimum sound insulation performance of 30dB R_w . This should be checked with the manufacturer of any proposed doorsets.

9.3 SOUND INSULATION BETWEEN CLASSROOMS & GROUP ROOMS

BB93 requires that, where teaching spaces are linked to another occupied room via an interconnecting door, the sound insulation performance meets a defined performance level. It is assumed that this is applicable to the partitions between the classrooms and group rooms.

The performance requirement of the separating wall structure is a minimum sound reduction of 45dB R_w . This would be expected to be achieved with the construction shown in Figure 7 & described in Section 9.2. The separating wall structure should extend to the underside of the roof structure in order to minimise flanking sound transmission.

In addition, a doorset should be used with a rating of at least 35dB R_w.

9.4 SERVICES

Where possible, services should not penetrate separating walls between spaces. However, it is understood that this is not possible in all situations. Therefore, we would recommend that the following steps are taken to reduce a potential weakness in the sound insulation performance.

- Electrical services, and small pipework (<13mm) can penetrate the wall but must be wall sealed with quality mastic or acoustic sealant at every junction.
- Larger pipework, ducts, soil pipes etc must be boxed in using timber/metal work and finished with two layers of 12.5mm Soundbloc board, with the void filled with mineral wool insulation.

9.5 OTHER CONSIDERATIONS

The following must be noted to minimise the possibility of poor sound insulation performance.

- The proposed construction details assume a good standard of workmanship, poor workmanship will lead to potential flanking paths and a poor sound insulation performance.
- Alternatives to the products and construction methods suggested in this report may be used. However, any changes to the specification must be checked with NCSL prior to installations. Requests to change and/or assess additional construction methods may be subject to additional fees.

10 REVERBERATION TIME

BB93 defines specific reverberation times for classrooms and ancillary spaces within schools. These reverberation time requirements are based upon TMF values, which are calculated as the arithmetic average reverberation time in the 500Hz, 1kHz and 2kHz octave bands.

10.1 REVERBERATION TIME WITHIN CLASSROOMS

The required TMF reverberation time for newly built 'SEN Calming' classrooms is ≤ 0.6 seconds.

Based upon the construction and finish of the existing school facilities, it is assumed that the classroom floors will be linoleum or vinyl adhered to concrete. Based upon the sound insulation wall design specification, as shown in Section 9, it is assumed the internal wall finish will be plaster. Furthermore, it is assumed that the classrooms will incorporate a lay-in-grid ceiling system with ceiling tiles.

The estimated reverberation time (RT60) and TMF performance of the proposed classrooms is shown in Figure 8.

In order to meet the required TMF, it is recommended that acoustic ceiling tiles are used. The calculations below incorporate the acoustic performance specifications of Soundsorba Ceilingsorba Suspended Acoustic Tiles.

The acoustic absorption coefficients of these ceiling tiles are shown below in Table 8. Alternative products may be used assuming they meet or exceed these absorption coefficients. Please contact NCSL for more information if alternative products are to be used, as further calculations may be required.

Frequency	125Hz	250Hz	500Hz	1kHz	2kHz
Acoustic Ceiling Tile Absorption Coefficients	0.5	0.85	0.95	0.9	1

TABLE 8 - SOUNDSORBA CEILINGSORBA ACOUSTIC TILES – ABSORPTION COEFFICIENTS

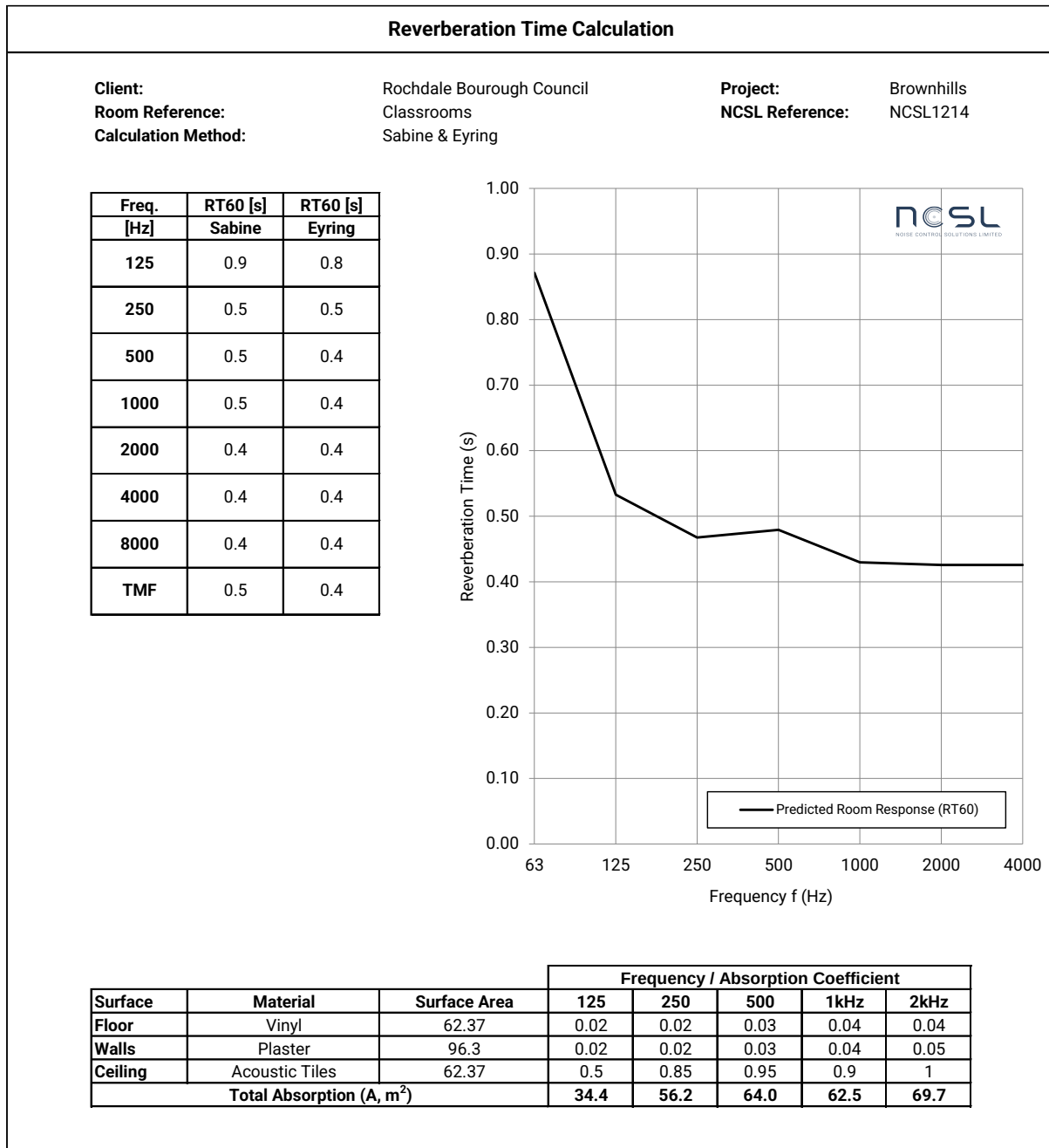


FIGURE 8 – CLASSROOM REVERBERATION CALCULATION

10.2 REVERBERATION TIME WITHIN GROUP ROOMS

The required TMF reverberation time for newly built 'SEN Calming' group rooms is ≤ 0.6 seconds.

Based upon the construction and finish of the existing school facilities, it is assumed that the group room floors will be linoleum or vinyl adhered to concrete. Based upon the sound insulation wall design specification, as shown in Section 9, it is assumed the internal wall finish will be plastered. Furthermore, it is assumed that the classrooms will incorporate a lay-in-grid ceiling system with ceiling tiles.

The estimated reverberation time (RT60) and TMF performance of the proposed classrooms is shown in Figure 9.

In order to meet the required TMF, it is recommended that acoustic ceiling tiles are used. The calculations below incorporate the acoustic performance specifications of Soundsorba Ceilingsorba Suspended Acoustic Tiles.

The acoustic absorption coefficients of these ceiling tiles are shown in Table 8. Alternative products may be used assuming they meet or exceed these absorption coefficients. Please contact NCSL for more information if alternative products are to be used, as further calculations may be required.

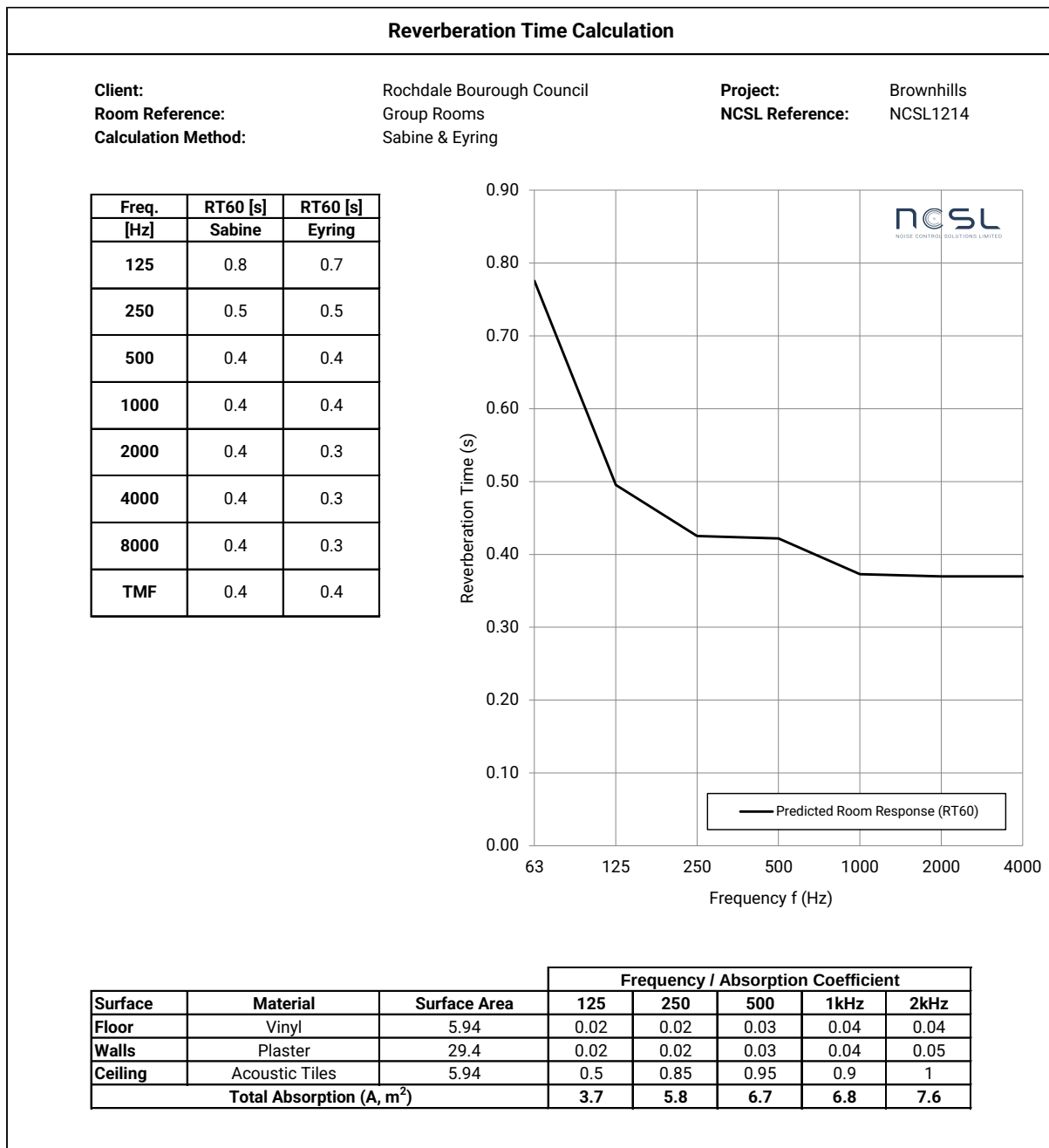


FIGURE 9 – GROUP ROOM REVERBERATION CALCULATION

10.3 REVERBERATION TIME WITHIN CORRIDORS

BB93 requires that reverberation time within corridors is controlled. Two methods are available, both of which are based upon the guidance provided within Building Regulations Approved Document E. It is expected that Method A is the preferred method in order to meet the requirements of BB93 and Approved

Document E. This requires a surface area equal to the floor area is covered by a Class C acoustic absorber or higher.

This is generally achieved with the installation of Class C acoustic absorber ceiling tiles in the corridor areas, and it is the recommendation of NCSL that this method is used.

11 NOISE IMPACT ASSESSMENT

A noise impact assessment has been undertaken based upon the required internal ambient noise levels within the development as per the guidance provided within Building Bulletin 93.

Based upon the measured ambient sound levels at the development site, as shown in Section 7, in conjunction with the proposed mitigation measures shown in Section 8, it is expected that the indoor ambient noise levels will meet the requirements of BB93.

Based upon the fact that there is no significant intensification of the school premises and operations, it is not expected that noise from the development will cause a significant noise impact at local receptors.

12 CONCLUSIONS & RECOMMENDATIONS

Noise Control Solutions Limited (NCSL) have been commissioned by Rochdale Borough Council to undertake a noise impact assessment for the proposed school extension at Brownhill Learning Community, Darnhill Site, Sutherland Road, Heywood, OL10 3PY. The current school has a capacity of 80 SEN students, with the proposed four-classroom extension allowing for an additional 40 SEN students.

The assessment is required in order to accompany the relevant planning application which is to be considered by Rochdale Borough Council.

This assessment also considers the internal acoustics of the proposed development, in accordance with Building Bulletin 93, which defines the requirements for sound insulation between rooms, indoor ambient sound levels and reverberation times.

Mitigation measures in terms of glazing and ventilation are shown in Section 8. It is expected that should these measures be followed, the internal ambient noise levels within the proposed extension will meet the requirements of BB93. It is noted that the ventilation requirements should be checked with a suitable consultant.

Based upon the fact that there is no significant intensification of the school premises and operations, it is not expected that noise from the development will cause a significant noise impact at local receptors.

An acoustic design specification is shown in Section 9, which details a proposed construction between classrooms, between classrooms and group rooms, and between classrooms and the ancillary corridor. It is expected that should these specifications be followed, the sound insulation performance within the proposed extension will meet the requirements of BB93.

Calculations of the expected reverberation time in the proposed rooms are detailed in Section 10. Mitigation measures are also proposed in the form of absorptive ceiling tiles. It is expected that should these measures be followed, the reverberation time within the noise sensitive areas of the proposed extension will meet the requirements of BB93.

Based upon the findings of this assessment, it is the recommendation of NCSL that the planning application is approved regarding noise impact.

The design specifications provided by NCSL have been considered only from an acoustic perspective. Any other requirements (such as fire, structural etc) should be assessed by a suitable consultant.

The behavior of sound through partitions is complex and not easily predicted, therefore no guarantees are provided as to the effectiveness of any proposed design specifications. However, it is the opinion of NSCL, based upon the available information, that the proposed specifications are likely to achieve the requirements of Building Bulletin 93.

Any recommendations contained within this report should be approved by the relevant authority before any work commences.

13 UNCERTAINTY

All measurements within this report have been taken under repeatable conditions and therefore any uncertainty in the result will be low.

To reduce measurement uncertainty, the following steps have been taken.

- The ambient sound level measurements were undertaken during dry weather and with wind speeds of less than 5m/s.
- The results of each measurement period were reported to the nearest 0.1dB.
- Noise measurements were made using one Class 1, integrating sound level meter.

All noise impact assessments and similar acoustic assessments inherently rely upon estimations and assumptions. This report should therefore be considered within this context.

APPENDIX A: ACOUSTIC SURVEY DATA

Time	LAeq	LAF90.0%	LAF10.0%	LAFmax	LAFmin	LZeq	LCeq
08:19:02	49.1	46.5	49.2	74.9	45.4	68.9	64.9
08:30:00	46.9	45.6	47.6	58.6	43.9	67.9	64.2
08:45:00	48.3	46.3	49	61	44.7	68.7	64.2
09:00:00	48.6	47.4	49.5	58.7	45.5	69.8	65.1
09:15:00	48.4	47	49.1	59.7	45.6	68.5	65.1
09:30:00	48.7	47.2	49.8	55.1	45.6	70.4	64.9
09:45:00	50	47.2	51.1	63.2	45.6	73	65.2
10:00:00	48.6	47.2	49.6	55.3	45.3	72.4	65
10:15:00	48.6	47.2	49.6	60.5	44.4	72.5	65.7
10:30:00	47.7	46	48.8	55.5	44.5	70.6	64.2
10:45:00	48.8	45.3	49	65.7	43.6	70	63.5
11:00:00	53.5	46.8	49.4	76.7	44.9	72.2	68.3
11:15:00	48.8	46.7	50	61.2	45.2	74.1	65.5
11:30:00	49.2	45.8	50.9	62.3	44.4	72.8	64.3
11:45:00	50.5	46	50.1	69.8	44.6	72.1	64.9
12:00:00	48.8	45.9	49.4	63.3	44.5	71.9	64.2
12:15:00	48.1	45.6	48.9	59.1	43.6	75.2	65.2
12:30:00	47.2	45.4	48.4	54.7	43.9	75	65
12:45:00	48.3	46.4	49.4	59.7	44.9	73.2	65.4
13:00:00	48.3	46.6	49.5	57.4	45	74.5	65.6
13:15:00	48.8	46.7	49.5	62.3	45.3	76	66
13:30:00	48.7	46.8	50.2	58.4	44.5	73.2	65
13:45:00	53.3	46.8	55.4	73	44.7	78.8	67.5
14:00:00	49	46.4	50.7	58.6	44.5	75.9	65.6
14:15:00	54.2	46.5	53.5	74.4	43.9	76.5	69
14:30:00	48.4	46.4	49.8	59.1	45.1	77.4	66.2
14:45:00	49.4	46.9	50.1	60	45	79	67.6
15:00:00	49.8	46.1	50.6	66.1	44.3	79.3	67.7
15:15:00	48.4	46.6	49.5	58	45	76	66

APPENDIX B: EXTERNAL WALL PERFORMANCE

Sound Insulation Prediction (v9.0.24)

Program copyright: Marshall Day Acoustics 2017

Margin of error is generally within $R_w \pm 3$ dB

Noise Control Solutions Limited - Key No. 5597

Job Name:

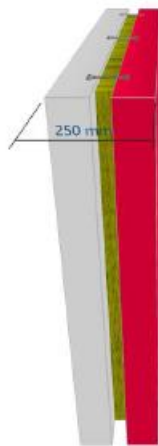
Job No.:

Date 05/08/2023

File Name:insul

Initials:conta

Notes:



R_w 56 dB

C -1 dB

C_{tr} -3 dB

Mass-air mass resonant frequency = 25 Hz

Panel Size = 2.7 m x 4.0 m

Partition surface mass = 349 kg/m²

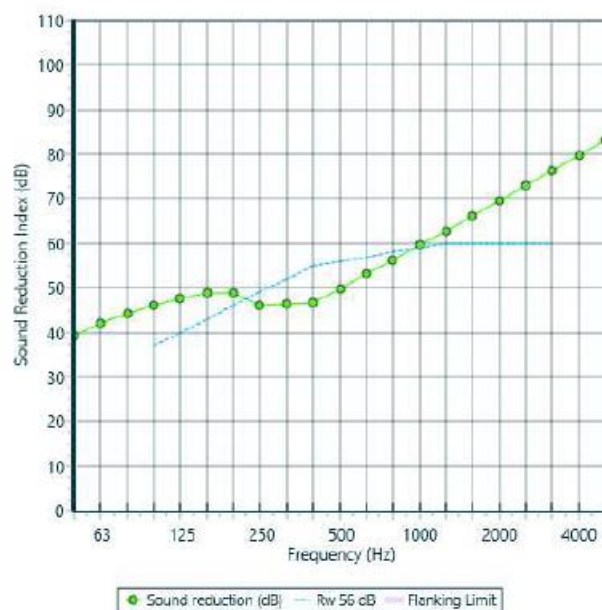
System description

Panel 1 : 1 x 100 mm Concrete Block

Frame: Butterfly Tie (50 mm x 45 mm), Stud spacing 600 mm, Cavity Width 50 mm, f. x Fibreglass (10kg/m³) 60mm Thickness 50 mm

Panel 2 : 1 x 100 mm Brick

freq.(Hz)	R(dB)	R(dB)
50	39	
63	42	41
80	44	
100	46	
125	48	47
160	49	
200	49	
250	46	47
315	46	
400	47	
500	50	49
630	53	
800	56	
1000	60	59
1250	63	
1600	66	
2000	69	69
2500	73	
3150	76	
4000	80	79
5000	83	



APPENDIX C: NOISE BREAK-IN CALCULATIONS

FORM VERSION: 2.3

Project Details	
NCSL Project Reference:	NCSL1214
Plot Reference:	Brownhill Extension
Room Reference:	Classroom 1
Façade Reference:	W

Room Details	
Length (m)	9.45
Width (m)	6.6
Height (m)	3
Surface Area (m ²)	221.04
Volume (m ³)	187.11
Reverberation Time (s)	0.5

Vent Specification:	Greenwood 2500EAW.AC1	No:	3
Wall Specification:	102.5mm brickwork, 50mm cavity w insulation, rigid wall ties, 100mm block + Timber Door (Classroom 1)	Area:	44.75
Glazing Specification:	4/6-12/4 (Pilkington)	Area:	5.1
Ceiling / Roof Specification:	KS1000 RW80 + No lining	Area:	62.37

	REF	125	250	500	1000	2000	Sum
L_{eq,ff} Daytime External noise level (free-field), dB(Z)	A_{day,Leq,Ext}	53.3	48.4	47.0	45.2	40.2	55.8
D_{n,e} Sound reduction of vent	-	39	38	29	47	43	-
(A₀/S) 10^{A(-D_{n,e}/10)}	B	0.00003	0.00004	0.00034	0.00001	0.00001	-
R_{wi} Sound reduction of window	-	21	17	25	35	37	-
(S_{wi}/S_t) 10^{A(-R_{wi}/10)}	C	0.00036	0.00091	0.00014	0.00001	0.00001	-
R_{ew} Sound reduction of external wall	-	35.11012	32.15642	36.12915	38.19158	44.19872	-
(S_{ew}/S_t) 10^{A(-R_{ew}/10)}	D	0.00012	0.00024	0.00010	0.00006	0.00002	-
R_{rr} Sound reduction of roof	-	18	20	24	20	29	-
(S_{rr}/S_t) 10^{A(-R_{rr}/10)}	E	0.00881	0.00556	0.00221	0.00556	0.00070	-
10*log(B+C+D+E)	F	-20.3	-21.7	-25.5	-22.5	-31.3	-
A Room Absorption (m²)	-	60.2	60.2	60.2	60.2	60.2	-
10*log(S/A)	G	2.7	2.7	2.7	2.7	2.7	-
A-weighting	A_{weight}	-16.1	-8.6	-3.2	0.0	1.2	-
R_w Sound reduction of complete partition	H	-	-	-	-	-	29
L_{Aeq} Daytime Internal noise level, dB(A)	A_n+F+G+3+A_{weight}	22.6	23.8	23.9	28.4	15.8	31

FORM VERSION: 2.3

Project Details	
NCSL Project Reference:	NCSL1214
Plot Reference:	Brownhill Extension
Room Reference:	Classroom 2
Façade Reference:	W

Room Details	
Length (m)	9.45
Width (m)	6.6
Height (m)	3
Surface Area (m ²)	221.04
Volume (m ³)	187.11
Reverberation Time (s)	0.5

Vent Specification:	Greenwood 2500EAW.AC1	No:	2
Wall Specification:	102.5mm brickwork, 50mm cavity w insulation, rigid wall ties, 100mm block + Timber Door (Classroom 2-4)	Area:	16.4
Glazing Specification:	4/6-12/4 (Pilkington)	Area:	3.4
Ceiling / Roof Specification:	KS1000 RW80 + No lining	Area:	62.37

	REF	125	250	500	1000	2000	Sum
L_{eq,ff} Daytime External noise level (free-field), dB(Z)	A_{day,Leq,Ext}	53.3	48.4	47.0	45.2	40.2	55.8
D_{n,e} Sound reduction of vent	-	39	38	29	47	43	-
(A₀/S) 10^{Λ(-D_{n,e}/10)}	B	0.00003	0.00004	0.00031	0.00000	0.00001	-
R_{wi} Sound reduction of window	-	21	17	25	35	37	-
(S_{wi}/S_f) 10^{Λ(-R_{wi}/10)}	C	0.00033	0.00083	0.00013	0.00001	0.00001	-
R_{ew} Sound reduction of external wall	-	30.75063	27.79693	31.76966	33.83209	39.83922	-
(S_{ew}/S_f) 10^{Λ(-R_{ew}/10)}	D	0.00017	0.00033	0.00013	0.00008	0.00002	-
R_{rr} Sound reduction of roof	-	18	20	24	20	29	-
(S_{rr}/S_f) 10^{Λ(-R_{rr}/10)}	E	0.01203	0.00759	0.00302	0.00759	0.00096	-
10*log(B+C+D+E)	F	-19.0	-20.6	-24.4	-21.1	-30.0	-
A Room Absorption (m ²)	-	60.2	60.2	60.2	60.2	60.2	-
10*log(S/A)	G	1.3	1.3	1.3	1.3	1.3	-
A-weighting	A_{weight}	-16.1	-8.6	-3.2	0.0	1.2	-
L_{Aeq} Daytime Internal noise level, dB(A)	A_n+F+G+3+A_{weight}	22.6	23.6	23.7	28.4	15.8	31

FORM VERSION: 2.3

Project Details	
NCSL Project Reference:	NCSL1214
Plot Reference:	Brownhill Extension
Room Reference:	Classroom 3
Facade Reference:	W

Room Details	
Length (m)	9.45
Width (m)	6.6
Height (m)	3
Surface Area (m ²)	221.04
Volume (m ³)	187.11
Reverberation Time (s)	0.5

Vent Specification:	Greenwood 2500EAW.AC1	No:	2
Wall Specification:	102.5mm brickwork, 50mm cavity w insulation, rigid wall ties, 100mm block + Timber Door (Classroom 2-4)	Area:	16.4
Glazing Specification:	4/6-12/4 (Pilkington)	Area:	3.4
Ceiling / Roof Specification:	KS1000 RW80 + No lining	Area:	62.37

	REF	125	250	500	1000	2000	Sum
L_{eq,ff} Daytime External noise level (free-field), dB(Z)	A_{day,Leq,Ext}	53.3	48.4	47.0	45.2	40.2	55.8
D_{n,e} Sound reduction of vent	-	39	38	29	47	43	-
(A₀/S) 10^{Λ(-D_{n,e}/10)}	B	0.00003	0.00004	0.00031	0.00000	0.00001	-
R_{wi} Sound reduction of window	-	21	17	25	35	37	-
(S_{wi}/S_f) 10^{Λ(-R_{wi}/10)}	C	0.00033	0.00083	0.00013	0.00001	0.00001	-
R_{ew} Sound reduction of external wall	-	30.75063	27.79693	31.76966	33.83209	39.83922	-
(S_{ew}/S_f) 10^{Λ(-R_{ew}/10)}	D	0.00017	0.00033	0.00013	0.00008	0.00002	-
R_{rr} Sound reduction of roof	-	18	20	24	20	29	-
(S_{rr}/S_f) 10^{Λ(-R_{rr}/10)}	E	0.01203	0.00759	0.00302	0.00759	0.00096	-
10*log(B+C+D+E)	F	-19.0	-20.6	-24.4	-21.1	-30.0	-
A Room Absorption (m ²)	-	60.2	60.2	60.2	60.2	60.2	-
10*log(S/A)	G	1.3	1.3	1.3	1.3	1.3	-
A-weighting	A_{weight}	-16.1	-8.6	-3.2	0.0	1.2	-
L_{Aeq} Daytime Internal noise level, dB(A)	A_n+F+G+3+A_{weight}	22.6	23.6	23.7	28.4	15.8	31

FORM VERSION: 2.3

Project Details	
NCSL Project Reference:	NCSL1214
Plot Reference:	Brownhill Extension
Room Reference:	Classroom 4
Façade Reference:	W

Room Details	
Length (m)	9.45
Width (m)	6.6
Height (m)	3
Surface Area (m ²)	221.04
Volume (m ³)	187.11
Reverberation Time (s)	0.5

Vent Specification:	Greenwood 2500EAW.AC1	No:	2
Wall Specification:	102.5mm brickwork, 50mm cavity w insulation, rigid wall ties, 100mm block + Timber Door (Classroom 2-4)	Area:	16.4
Glazing Specification:	4/6-12/4 (Pilkington)	Area:	3.4
Ceiling / Roof Specification:	KS1000 RW80 + No lining	Area:	62.37

	REF	125	250	500	1000	2000	Sum
L_{eq,ff} Daytime External noise level (free-field), dB(Z)	A_{day,Leq,Ext}	53.3	48.4	47.0	45.2	40.2	55.8
D_{n,e} Sound reduction of vent	-	39	38	29	47	43	-
(A₀/S) 10^{Λ(-D_{n,e}/10)}	B	0.00003	0.00004	0.00031	0.00000	0.00001	-
R_{wi} Sound reduction of window	-	21	17	25	35	37	-
(S_{wi}/S_f) 10^{Λ(-R_{wi}/10)}	C	0.00033	0.00083	0.00013	0.00001	0.00001	-
R_{ew} Sound reduction of external wall	-	30.75063	27.79693	31.76966	33.83209	39.83922	-
(S_{ew}/S_f) 10^{Λ(-R_{ew}/10)}	D	0.00017	0.00033	0.00013	0.00008	0.00002	-
R_{rr} Sound reduction of roof	-	18	20	24	20	29	-
(S_{rr}/S_f) 10^{Λ(-R_{rr}/10)}	E	0.01203	0.00759	0.00302	0.00759	0.00096	-
10*log(B+C+D+E)	F	-19.0	-20.6	-24.4	-21.1	-30.0	-
A Room Absorption (m ²)	-	60.2	60.2	60.2	60.2	60.2	-
10*log(S/A)	G	1.3	1.3	1.3	1.3	1.3	-
A-weighting	A_{weight}	-16.1	-8.6	-3.2	0.0	1.2	-
L_{Aeq} Daytime Internal noise level, dB(A)	A_n+F+G+3+A_{weight}	22.6	23.6	23.7	28.4	15.8	31

FORM VERSION: 2.3

Project Details	
NCSL Project Reference:	NCSL1214
Plot Reference:	Brownhill Extension
Room Reference:	Classroom 1 - Group Room
Façade Reference:	W

Room Details	
Length (m)	2.2
Width (m)	2.7
Height (m)	3
Surface Area (m ²)	41.28
Volume (m ³)	17.82
Reverberation Time (s)	0.5

Vent Specification:	Greenwood 2500EAW.AC1	No:	1
Wall Specification:	102.5mm brickwork, 50mm cavity w insulation, rigid wall ties, 100mm block + Timber Door (Classroom 1)	Area:	6.6
Glazing Specification:	4/6-12/4 (Pilkington)	Area:	1.7
Ceiling / Roof Specification:	KS1000 RW80 + No lining	Area:	5.94

	REF	125	250	500	1000	2000	Sum
L_{eq,ff} Daytime External noise level (free-field), dB(Z)	A_{day,Leq,Ext}	53.3	48.4	47.0	45.2	40.2	55.8
D_{n,e} Sound reduction of vent	-	39	38	29	47	43	-
(A₀/S) 10^{A(-D_{n,e}/10)}	B	0.00009	0.00011	0.00088	0.00001	0.00004	-
R_{wi} Sound reduction of window	-	21	17	25	35	37	-
(S_{wi}/S_f) 10^{A(-R_{wi}/10)}	C	0.00095	0.00238	0.00038	0.00004	0.00002	-
R_{ew} Sound reduction of external wall	-	35.11012	32.15642	36.12915	38.19158	44.19872	-
(S_{ew}/S_f) 10^{A(-R_{ew}/10)}	D	0.00014	0.00028	0.00011	0.00007	0.00002	-
R_{rr} Sound reduction of roof	-	18	20	24	20	29	-
(S_{rr}/S_f) 10^{A(-R_{rr}/10)}	E	0.00661	0.00417	0.00166	0.00417	0.00053	-
10*log(B+C+D+E)	F	-21.1	-21.6	-25.2	-23.7	-32.2	-
A Room Absorption (m ²)	-	5.7	5.7	5.7	5.7	5.7	-
10*log(S/A)	G	3.9	3.9	3.9	3.9	3.9	-
A-weighting	A_{weight}	-16.1	-8.6	-3.2	0.0	1.2	-
L_{Aeq} Daytime Internal noise level, dB(A)	A_n+F+G+3+A_{weight}	23.1	25.1	25.6	28.5	16.2	32

FORM VERSION: 2.3

Project Details	
NCSL Project Reference:	NCSL1214
Plot Reference:	Brownhill Extension
Room Reference:	Corridor
Façade Reference:	W

Room Details	
Length (m)	36.8
Width (m)	2.2
Height (m)	3
Surface Area (m ²)	395.92
Volume (m ³)	242.88
Reverberation Time (s)	0.5

Vent Specification:	No Vent	No:	0
Wall Specification:	102.5mm brickwork, 50mm cavity w insulation, rigid wall ties, 100mm block + Timber Door (Corridor)	Area:	5.1
Glazing Specification:	No Window	Area:	0
Ceiling / Roof Specification:	KS1000+2NO SB	Area:	80.96

	REF	125	250	500	1000	2000	Sum
L_{eq,ff} Daytime External noise level (free-field), dB(Z)	A_{day,Leq,Ext}	53.3	48.4	47.0	45.2	40.2	55.8
D_{n,e} Sound reduction of vent	-	0	0	0	0	0	-
(A₀/S) 10^{A(-D_{n,e}/10)}	B	0.00000	0.00000	0.00000	0.00000	0.00000	-
R_{wi} Sound reduction of window	-	0	0	0	0	0	-
(S_{wi}/S_f) 10^{A(-R_{wi}/10)}	C	0.00000	0.00000	0.00000	0.00000	0.00000	-
R_{ew} Sound reduction of external wall	-	22.91583	19.96213	23.93486	25.99729	32.00442	-
(S_{ew}/S_f) 10^{A(-R_{ew}/10)}	D	0.00030	0.00060	0.00024	0.00015	0.00004	-
R_{rr} Sound reduction of roof	-	32	47	61	69	69	-
(S_{rr}/S_f) 10^{A(-R_{rr}/10)}	E	0.00059	0.00002	0.00000	0.00000	0.00000	-
10*log(B+C+D+E)	F	-30.5	-32.1	-36.2	-38.3	-44.3	-
A Room Absorption (m ²)	-	78.2	78.2	78.2	78.2	78.2	-
10*log(S/A)	G	0.4	0.4	0.4	0.4	0.4	-
A-weighting	A_{weight}	-16.1	-8.6	-3.2	0.0	1.2	-
L_{Aeq} Daytime Internal noise level, dB(A)	A_n+F+G+3+A_{weight}	10.2	11.1	11.0	10.4	0.6	17

TERMS AND CONDITIONS OF BUSINESS

1. GENERAL

Work done or services undertaken are subject to the terms and conditions detailed below and all other conditions, warranties and representations, expressed or implied are hereby excluded.

2. PRICES

Prices are based on current costs, exchange rates, duty and freight and are subject to change without notice. The quoted price does not cover the cost of attending meetings, telephone calls or email exchanges. This is charged separately at a pro rata hourly rate of £75 per hour.

3. TIMING ESTIMATES

Timing estimates are made in good faith and date from receipt of a written order and full information to enable us to proceed. While NCSL makes every effort to fulfil them, such estimates are subject to unforeseen events and if not maintained, cannot give rise to any claim.

4. CANCELLATION AND RETURNS

Cancellation of orders for services, training or consultancy is only acceptable by prior agreement of NCSL and a charge will normally be made. NCSL reserve the right to cancel any work at any time.

5. CLAIMS

Claims for errors etc should be notified within 10 days of date of receipt.

6. PAYMENT TERMS

Full payment is required before any work is undertaken by NCSL. Failure to comply with the terms of payment may result in delayed delivery of services and a review of the Customer's credit account (if applicable). Should the customer become subject to an administration order, or becomes bankrupt or goes into liquidation, NCSL has a right to cancel any contract and discontinue any work.

7. RETENTION OF TITLE

All reports & data remain the property of NCSL. Under no circumstances will a customer's purchase order override our Retention of Title clause. In the case of software and data, the ownership remains with NCSL. Payment of invoices in full will entitle the customer to use reports or other services under licence until (a) a set expiry date is passed (b) they cease trading. In both instances, the licence shall then revert to NCSL. All measurement data and reports are the sole property of NCSL and shall not be reproduced or distributed without written consent from NCSL.

8. TEST REPORTS

NCSL shall not be liable for any subsequent loss or damage incurred by the client as a result of information supplied in a test report. Any specifications or targets supplied by NCSL are to be considered as guidance only. No guarantee is offered by NCSL that the meeting of any supplied targets or specifications will solve the relevant issue or prevent future issues.

9. RESPONSIBILITY

Every effort is made to ensure accuracy in description, drawings and other information in correspondence etc but no warranty is given in this respect and NCSL shall not be liable for any error therein. NCSL carries out all tests and/or advises only on the basis that the same are carried out, made or given without any responsibility whether for negligence or otherwise. NCSL and its servants or agents will not be liable for any damage or loss direct or indirect of whatsoever kind, whether or not the same results directly or indirectly from negligence on the part of NCSL or its servants or agents.

10. CONFIDENTIALITY

Unless specifically excluded in the terms of an individual contract between NCSL and its Customer, the following shall apply to all reports, advice, drawings, photographs, specifications or data:

- i. The above shall not be disclosed to third parties or used in litigation without the consent of NCSL.
- ii. Where NCSL has given consent to disclosure, the Customer shall draw the attention of the third party to these terms of business and the basis on which NCSL undertakes test, reporting and advising. The Customer shall indemnify NCSL for any failure to do so.
- iii. The above items are submitted to the Customer as confidential documents. Confidentiality shall continue to apply after completion of the business but shall cease to apply to information or knowledge which may come into the public domain.

11. CONSTRUCTION AND ARBITRATION

The laws of England shall govern all contracts and the parties submit to exclusive jurisdiction of the courts of England, unless otherwise agreed.

12. JOB SPECIFIC TERMS

NCSL will not be held responsible for any adverse impact arising from the introduction of proposed palliative measures. Furthermore, no guarantee is given regarding the effectiveness of any proposed palliative and/or mitigation measures. The client is responsible for any palliative measures, including, but not limited to, the sourcing of suppliers, the quality of installation, the cost of all materials / installation, maintenance and safety. All advice given should be taken as guidance only. It is the responsibility of the client to ensure the safe operation of any mitigation measures, including but not limited to, adequate fire safety and ventilation requirements. NCSL provide no guarantee that adherence to provided specifications will result in no further noise and/or vibration complaints and/or the elimination of noise and/or vibration issues. NCSL do not supply, procure, install or maintain any materials. We reserve the right to publicise the work conducted by NCSL, including, where appropriate, client logos etc. On occasion, work may be conducted by sub-contract partners.