soundtesting
acoustic consultancy & air leakage specialists

Environmental Noise Impact Report

Proposed Educational Development
Existing Moor Hall Wedding Venue
South Ockendon
RM15 4UU

Date of Report: Thursday 13th October 2022

Reference: 15134 Version 4

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1 General Information

1.1 Client Instructing Survey

Witherslack Group Limited
Lupton Tower
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1.2 Date of Noise Survey

Tuesday 24th August 2021

1.3 Quality Assurance Information

	Name	Position	Date
Prepared by	William Wright BSc MIOA	Acoustic Consultant	10/09/2021
Checked By	Nicholas Barber BSc MIOA	Principal Acoustic Consultant	10/09/2021

1.4 Revision History

Revision Number	Revision Date	Details	
V1	06/05/2021	First issue	WW
V2	13/01/2022	Updated proposals include residential accommodation for children. Assessment to internal BS8233:2014 Criteria added	WW
V3	07/02/2022	Minor amendments following clarification of existing windows, drawing reference and development reference	WW
V4	13/10/2022	Updated proposals include removing residential accommodation. Reference to BS8233:2014 and monitoring positions 3 and 4 removed.	JH

2 Introduction

Witherslack Group Ltd has instructed Soundtesting.co.uk Limited to undertake an environmental noise survey in order to assess the impact of commercial/industrial noise, as well as other general noise within the local environment, which may have an impact on the proposed educational development.

The proposed development site is an existing wedding venue including the main house building and several outbuildings including a marquee. It is proposed to convert the site into an educational facility including classrooms, therapy rooms, staff rooms and amenities. As of Version 4 of this report, the proposals have been updated to remove residential accommodation for the attending children. The following assessment will therefore be made during daytime operational hours only.

This report is prepared solely for Witherslack Group Ltd. Soundtesting.co.uk Limited accepts no responsibility for its use by any third party.

This document has been prepared using the various documents listed within the appendices of this report, together with drawings, technical information and additional verbal representations made by third parties. We have not audited nor independently verified the content or accuracy of any of the documents and information provided to us in the preparation of this report.

If additional information comes to light subsequent to the production of this report, we reserve the right to revise our opinions and the conclusions reached within this report.

2.1 An Environmental Noise Assessment

Soundtesting.co.uk Ltd has undertaken an environmental noise assessment at the above site with noise levels measured externally over a 3-hour sample period on Tuesday 24th August between 11:15 and 14:15 hours.

Soundtesting.co.uk Ltd. has also undertaken an unmanned 24-hour survey of sound levels in order to obtain a full 16-hour day and 8-hour night-time of sound levels in order to assess the living accommodation. As of version 4 of this report, the living accommodation has been removed from the application. The following assessment will therefore refer to daytime sound levels only, in accordance with BB93.

This report will state the measured noise levels and will refer to guidance relevant to the nature of this survey whilst considering National and Local Planning Authority guidance and conditions.

3 Assumptions, Limitations & Uncertainty

a. All suggested specifications require a good level of workmanship and for materials to be installed as the manufacture intends. Any poor workmanship may lead to weaknesses in the sound attenuation provided by the building elements.
b. It is assumed that the sound pressure levels measured on site during the environmental noise survey are typical of the site.
c. It is assumed that the technical data provided by glazing and ventilation manufacturers is up to date and correct.
d. It is assumed that drawings and information supplied by Witherslack Group Ltd are up to date and correct.

4 Planning Policies, Guidance and Criteria

The planning policies and criteria listed below are taken from associated relevant guidance documents, all of which should be considered for the internal and external noise and vibration levels.

4.1 National Planning Policy

The National Planning Policy Framework (NPPF) July 2018 set out the Government's planning policies for England and how they are expected to be applied. It provides a framework within which the Local Authorities are to prepare local plans and use their planning powers to minimise the adverse impact of noise. It should contain the following in relation to noise impacts.

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

'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.'

180. 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:

'mitigate and reduce to a minimum potential adverse impact resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life'

NPPF characterises noise by grading and recommending actions and different effect levels as reproduced in Table 1

Table 1: Noise exposure hierarchy based on likely average response			
Perception	Examples of outcomes	Increasing effect level	Action
No Observed Effect Level			
Not present	No Effect	No Observed Effect	No specific measures required
No Observed Adverse Effect Level			
Present and 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 and 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 and reduce to a minimum
Significant Observed Adverse Effect Level			
Present and 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 Adverse Effect	Avoid
Present and 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

4.2 Criteria

4.2.1 Local Authority Criteria

At the time of writing the report, the consultant is unaware of any conditions or specific criteria provided by the Local Planning Authority; therefore, the consultant deems it most appropriate that the following assessment will be undertaken in order to meet the internal ambient criteria given in BB93 Acoustic design of schools: Performance Standards.

4.2.2 Building Bulletin 93 Acoustic design of schools: Performance Criteria 2015

The above document is intended to provide advice to all those involved in the specification, design and construction of school buildings.

Table 1 of the document (Shown below as Table 2 of this report) specifies upper limits for indoor ambient noise levels in terms of LAeq,30mins during normal teaching hours. Values for refurbishment are also the minimum acceptable standards for alternative performance standards in new buildings.

The room type categories relevant to those proposed at the development site have been included below, with all irrelevant rooms excluded from this copy of the table.

Table 2: Noise Activity and Sensitivity levels and upper limits for indoor ambient noise levels

Type of Room	Room Classifications for the purpose of airborne sound insulation...		Upper Limit for the indoor ambient noise level $L_{Aeq,30minutes}$ dB	
	Activity noise (Source Room)	Noise Tolerance (Receiving Room)	New Build	Refurbishment
Nursery school rooms Primary school: classroom, class base, general teaching area, small group room Secondary school: classroom, general teaching area, seminar room, tutorial room, language laboratory	Average	Medium	35	40
Teaching space intended specifically for students with special hearing and communication needs2	Average	Low	30	35
SEN calming room	High	Low	35	35
Administration and ancillary spaces: Kitchen Office, medical room, staff room Corridor, stairwell, coats and locker area Changing area Toilet	High Low Average High Average	High Medium High High High	50 40 45 50 50	55 45 55 55 55

In this report, measured external noise break-in will be estimated and assessed against the upper limits provided in BB93 Table 1 (Table 2 of this report)

4.3 Criteria Summary

In order to ensure that the proposed educational development will achieve suitable internal ambient sound levels, the assessment and recommendations will be made in reference to Building Bulletin 93.

5 Site Description

The proposed development at the existing Moor Hall wedding venue is an area of land in Aveley, off Romford Road, separated from the road by Kennington Park by approximately 0.5km. At the development site there is a main 3No. storey house building located approximately centrally, with 3No. smaller 1No. storey outbuildings located at the north, middle and south end of the western boundary. The existing marquee building located at the middle of the western boundary is to be removed with only the small accompanying outbuilding to remain.

West of the site is a large field, and to the south and east of the site is Kennington Park and a large area of privately owned green field. North of the site is an industrial commercial premises PT Commercials Ltd. which appears to service automobiles as well as store them. Various warehouses and workshops make up part of the premises to the north as well as external yards where vehicles are being stored.

During the manned survey it was observed that mechanical plant and machinery noise was audible from the north façade of the main house building and that PT Commercials Ltd. was in operation during the measurement period.

Soundtesting.co.uk Ltd. have been informed by Broadgrove that existing glazing at the property is standard double glazing such as 4mm glass/ 20mm void/ 4mm glass.

5.1 Subjective Observations

During the manned survey it was observed that mechanical plant and machinery noise was audible from the north façade of the main house building and that PT Commercials Ltd. was in operation during the measurement period. A guard dog at PT Commercials Ltd. was also audible intermittently at the north façade of the existing wedding venue house.

5.2 Weather

Table 3: Weather Conditions	
Description	**Daytime Average**
Temperature	23°C
Wind Speed	4.5m/s
Wind Direction	SW
Precipitation	Dry
Damp road/ wet ground	None
Fog/snow/ice	None

Relatively strong winds flowing southwest may have carried noise from the M25 towards the development site potentially increasing the measured external ambient sound levels. As the site is within 2km of both the M25 to the east and the A13 to the south, it is likely that these conditions can be considered typical.

6 Noise Measurement Procedure

6.1 Personnel Present

William Wright BSc MIOA

6.2 Survey Equipment Used

Table 4: Survey Equipment Used			
Manufacturer	Model	Serial No.	Description
Rion	NL52	1032413	Real Time Analyser Sound Level Meter
Pulsar	Model 105	59964	Acoustic Calibrator
Rion	NL52	00976149	Real Time Analyser Sound Level Meter
Rion	Model NC - 74	34678495	Acoustic Calibrator

6.3 Calibration

The sound level meters were calibrated with the field calibrator to a level of 94.0 dB @ 1 kHz prior to and on completion of the survey. No significant drift in calibration was observed. The meters used during the survey are precision grade class 1.

Calibration certificates are available on request.

6.4 External Ambient Sound Measurements

The measurement locations chosen during the survey was deemed suitable for the determination of the noise levels able to impact upon the façades of the proposed development.

The sound level meters were set to measure L_{Aeq}, L_{A90}, L_{A10}, and L_{AFmax} in 5 minute periods, as well as A-weighted 1:1 octave spectrum analysis.

6.4.1 Monitoring Position 1

A microphone was placed externally at a height of 1.5m above the ground north of the existing main house property with line of sight to some structure at PT Commercials Ltd. The measurement at position 1 was undertaken for 3 hours.

6.4.2 Monitoring Position 2

A microphone was placed externally at a height of 1.5m above the ground at 1m from the southern façade of the existing main house property with line of sight fully obscured to PT Commercials Ltd. The measurement at position 2 was undertaken for 2 hours, overlapping with 2 of the 3 hours measure at position 1.

The detail below shows the proposed development and location positions of the meters.

Monitoring position 1

Monitoring position 2

7 Results and Analysis

7.1 External Ambient Sound Measurement Analysis in Accordance with BS8233:2014

The following table presents the measured results from all monitoring positions.

Data charts can be found in the appendix.

Table 5: Measurement Results

Monitoring position	Time Period	Time Base T (hours)	$L_{Aeq,T}$ (dB)	Worst Case Measured $L_{Aeq,30minutes}$ (dB)
1	11:15 – 14:15	3	45.5	48.2
2	11:40 – 13:40	2	47.2	48.7

From the above it is clear that noise from PT Commercials Ltd, whilst present and observed, was not the dominant noise source, with general road traffic and aircraft and environmental noise contributing at a similar level.

The worst case hour of 48.7dB will be taken as a conservative indication of the worst case sound levels incident on the facades of the proposed educational development.

8 Assessment to BB93 Upper Limits for Internal Ambient $L_{Aeq,30minutes}$

Using the BRE Building Element Evaluation tool, the external noise break-in and resulting internal $L_{Aeq,30minute}$ ambient level values can be determined based on the measured external levels.

The following are the criteria for all proposed room types at the educational development that require upper limits.

Table 6: Room Types and Upper Limits

Room Type	Upper Limit for the indoor ambient noise level $L_{Aeq,30minutes}$ dB
Classroom	40
Sensory Integration Room	35
Therapy*	35
Office/Staff Room/Medical Room	45
Kitchen	45

*Therapy rooms have been designated the same upper limit as Sensory Integration Rooms as a nearest approximation

9 Recommendations

The estimated internal noise levels attributed by the external noise sources have been assessed over an average of $L_{Aeq,T}$ from the daytime and night-time survey periods and L_{AFmax} values from the night time. This along with the results from building element evaluation provide the basis for the following recommendations.

Whilst in attendance on site, the consultant noted that the existing glazing appears to be single pane sash windows and glazed doors. According to the proposed plan elevation drawings provided to Soundtesting.co.uk Ltd. this is not proposed to change.

9.1 Glazing & Ventilation Specification for all façades

The glazing specification in all areas must consist of 4mm glass/ (12-20mm void)/4mm glass double glazing as existing at the site.

Should mechanical ventilation be utilized, the upper limits set out in BB93 must be adhered to by cumulative noise resulting from external ambient break-in and mechanical plant operation.

9.2 Calculation Methodology

The BRE Building Envelope Insulation calculator has been used for the noise break in calculations for the BS8233:2014 assessment which is based on the rigorous calculation method of BS8233:2014 and BS EN 12354-3.

All room dimensions used in calculations are based a sample of each room type on drawings provided by the architect.

The calculations assume the external walls to be brick and block as stated in BS8233:2014.

The calculations assume each room has a reverberation time of 0.5 seconds.

The predictions also have been calculated assuming all windows are tightly closed.

9.3 Building Elements

The following table shows the expected performance of the recommended building elements.

Table 7: Table showing recommended building elements

Element	Description*	$R_w/D_{n,e,w}$ C; C_{tr} (dB)	Octave Centre Frequencies (Hz) SRI / $D_{n,e}$ (dB)					
			125	250	500	1k	2k	4k
Glazing	4mm/(12)/4mm Double Glaze BS12758:2011	29 (-1;-4)	21	17	25	35	37	31

**The selected units or products described have been used as a guide to form part of the specification. Other similar units or products can be used provided they can achieve the given minimum acoustic performance.*

9.4 Example of Estimated Performance

The following table compares the estimated performance values with the measured values.

Table 8: Estimated performance

Specification	Time period	Measured External	Estimated Internal
		Average $L_{Aeq,T}$ (dB)	$L_{Aeq,T}$ (dB)
Worst Case Example – Sensory Room	Worst Case 30 minutes	48.7	16.4

In the worst case, internal ambient levels resulting from external noise break-in will be 18.6 dB below the upper limit set out in BB93.

10 Conclusion

This report demonstrates that the existing glazing and ventilation at the proposed educational development will provide suitable façade insulation such that upper limits for internal ambient $L_{Aeq,30mins}$ within school rooms are not breached by external noise break-in.

11 References

National Planning Policy Framework (NPPF)

BS 7445-1:2003 Description and measurement of environmental noise – Part 1: Guide to quantities and procedures

Building Bulletin 93 Acoustic design of schools: Performance Criteria 2015

BS 6262-2:2005 Glazing in buildings – Part 2: Code of practice for energy, light and sound

openstreetmap.org

www.google.co.uk/maps

11.1 Drawing References

-001 Existing Site Layout

-002 Proposed Site Layout (with Existing Overlay)

-003 Proposed Site Layout

-004 Existing House Layout

-005 Proposed House Layout

-006 House Elevations

-007 Existing Outbuildings

-008 Proposed Outbuildings

-009 Outbuilding Elevations

-010 OS Plan

-011 Proposed Fencing and Gates

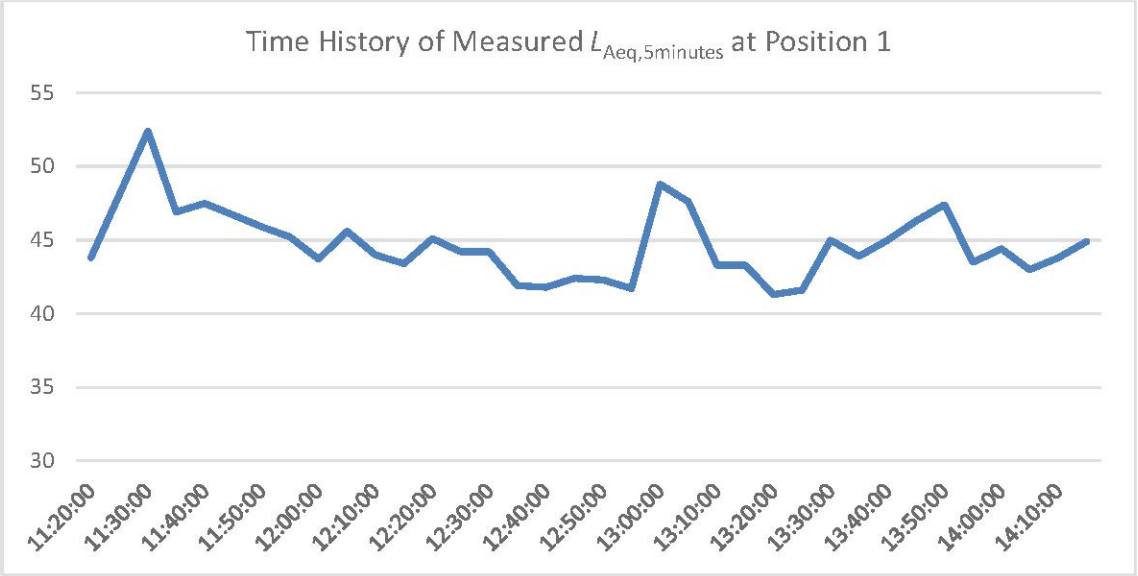
Appendix

Figure 1: Picture Showing Monitoring Position 1

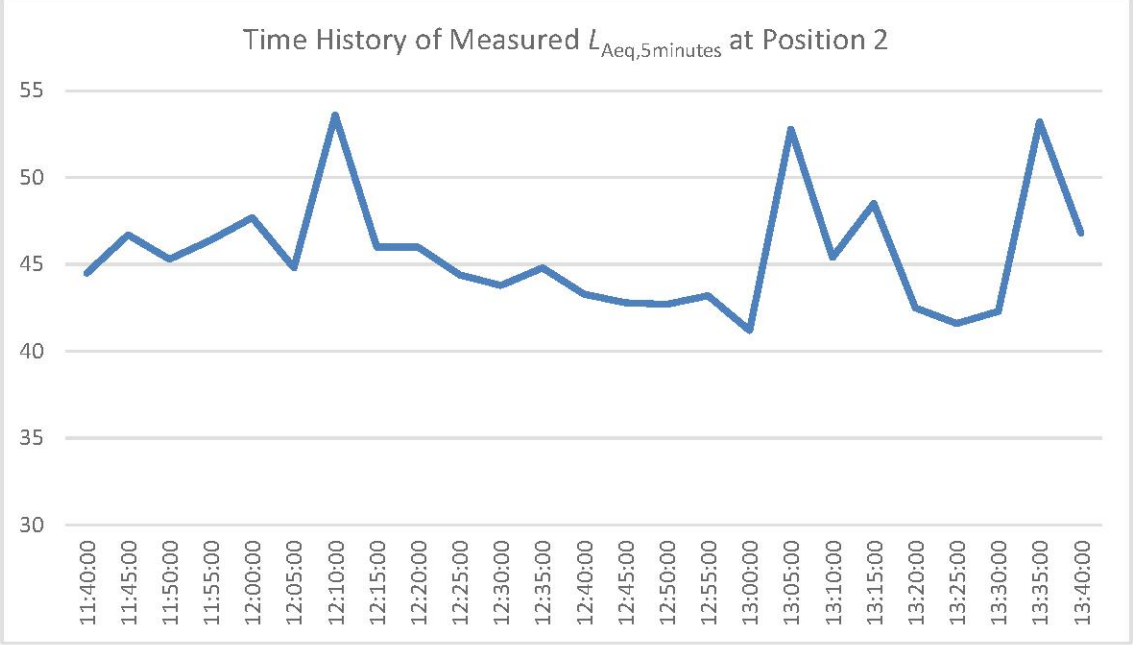
Figure 2: Picture Showing Monitoring Position 2

Measurement Results

Monitoring Position 1



Monitoring Position 2



Un-weighted 1:1 Octave Results