

NOISE IMPACT ASSESSMENT



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Proposed Residential Development On Land To The Rear Of Earl Street, Prestwich. M25 1GQ

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ISSUE 01





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1.0 INTRODUCTION

DAA Group has been appointed to carry out a Noise Impact Assessment at Earl Street, Prestwich. M25 1GQ. The purpose of the survey is to assess the suitability of the site for the extension and re-development of the existing former nursery building on site to create four new dwellings and the construction of 13 No. new dwellings with associated external works in accordance with the provisions of the National Planning Policy Framework, the Noise Policy Statement for England (NPSE) and the World Health Organisation Guidelines for Community Noise 1999 (WHO) and Bury Council Local Plan. Page | 3

Due to Covid-19, representative measurements have been used for this report.

Outline mitigation measures are considered and an appraisal of the requirements of external building fabric elements are provided where appropriate, as well as an assessment of internal and external noise levels.

An assessment of the sound insulation is included.

The technical content of this assessment has been provided by a Tech member of the Institute of Acoustics.

The Institute of Acoustics is the UK's professional body for those working in acoustics, noise and vibration

2.0 NOISE CRITERIA

2.1 NATIONAL PLANNING POLICY FRAMEWORK (NPPF)

The Department for Communities and Local Government introduced the National Planning Policy Framework (NPPF) in March 2012. The latest revision of the NPPF is dated July 2018.

The NPPF sets out the Government's planning policies for England and how these are expected to be applied. It provides a framework where local Councils can produce their own local and neighbourhood plans which reflect the needs of their communities.

In conserving and enhancing the natural environment, the planning system should prevent both new and existing development from contributing to, or being put at, unacceptable risk from environmental factors including noise.

Planning policies and decisions should aim to avoid noise giving rise to significant adverse impacts on health and quality of life as a result of new development. Conditions may be used to mitigate and reduce noise to a minimum so that adverse impacts on health and quality of life are minimised. It must be recognised that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them. Reference is made within NPPF to the Noise Policy Statement for England (NPSE) as published by DEFRA in March 2015

2.2 NOISE POLICY STATEMENT FOR ENGLAND (NPSE)

The long-term vision of the NPSE is stated within the documents scope, to 'promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development'. The policy aims are stated to:

- 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.

The application of NPSE should mean that noise is properly taken into account at the appropriate time (for example in planning applications or appeals) where it must be considered alongside other relevant issues. The guiding principles of Government policy on sustainable development should be used to assist in the implementation of the NPSE.

The NPSE should apply to all types of noise apart from occupational noise in the workplace. The types of noises defined in the NPSE includes:

- Environmental noise from transportation sources;
- Neighbourhood noise which includes noise arising from within the community; industrial premises, trade and business premises, construction sites and noise in the street

The Noise Policy Statement England (NPSE) outlines observed effect levels relating to the above, as follows:

- **NOEL – No Observed Effect Level**

- o 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**

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

- **SOAEL – Significant Observed Adverse Effect Level**

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

As stated in The Noise Policy Statement England (NPSE), it is not currently possible to have a single objective based measure that defines SOAEL that is applicable to all sources of noise in all situations. Specific noise levels are not stated within the guidance for this reason, and allow flexibility in the policy until further guidance is available.

2.3 ProPG: PLANNING AND NOISE

As outlined above, the National Planning Policy Framework encourages improved standards of design, although it provides no specific noise levels which should be achieved on site for varying standards of acoustic acceptability, or a prescriptive method for the assessment of noise.

ProPG: Planning and Noise was published in May 2017 in order to encourage better acoustic design for new residential schemes in order to protect future residents from the harmful effects of noise. This guidance can be seen as the missing link between the current NPPF and its predecessor, PPG24 (Planning Policy Guidance 24: Planning and Noise), which provided a prescriptive method for assessing sites for residential development, but without the nuance of 'good acoustic design' as outlined in ProPG.

ProPG allows the assessor to take a holistic approach to consider the site's suitability, taking

into consideration numerous design factors which previously may not have been considered alongside the noise level measured on site, for example the orientation of the building in relation to the main source of noise incident upon it.

It should be noted this document is not an official government code of practice, and neither replaces nor provides an authoritative interpretation of the law or government policy, and therefore should be seen as a good practice document only.

2.4 ACOUSTICS VENTILATION AND OVERHEATING

The AVO Guide includes:

- * an explanation of ventilation requirements under the building regulations and as described in Approved Document F, along with typical ventilation strategies and associated noise considerations;
- * an explanation of the overheating assessment methodology described in CIBSE TM59; potential acoustic criteria and guidance relating to different ventilation and overheating conditions, for both environmental noise ingress and building services noise;
- * and a worked example of the application of the AVO Guide including indicative design solutions.

The AVO Guide is intended for the consideration of new residential development that will be exposed predominantly to airborne sound from transport sources, and to sound from mechanical services that are serving the dwellings in question. Although the policy coverage is limited to England, the approach may be applicable in other parts of the UK.

The AVO Guide is intended to contribute to the practice of good acoustic design, as emphasised in the Professional Practice Guidance on Planning and Noise (ProPG). In particular

2.5 BRITISH STANDARD BS 8233:2014

British Standard Code of Practice BS8233:2014 'Sound insulation and noise reduction for buildings' provides recommended guideline value for internal noise levels within dwellings which are similar in scope to guideline values contained within the World Health Organisation Guidelines for Community Noise 1999 (WHO).

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living room	35 dB LAeq, 16hour	
Dining	Dining room/area	40 dB LAeq, 16hour	
Sleeping (daytime resting)	Bedroom	35 dB LAeq, 16hour	30 dB LAeq, 8hour

2.4.1 Indoor ambient noise levels for dwellings

The WHO guideline noise criteria set an internal sleep disturbance noise limit of 45dB LAmax,F which should not be exceeded on a regular basis.

3.0 SITE SURVEYS

3.1 SITE DESCRIPTION

The site is bounded by mixed commercial and residential buildings. The site is typical of an urban cityscape environment, with the dominant source being road traffic noise from the surrounding roads. (See Figure 3.1)

(See Figure 3.1)



Figure 3.1 – Proposed Site

3.2 ENVIRONMENTAL SITE SURVEY PROCEDURE

Due to Covid-19 and currently being in lockdown, noise measurements would not be representative at this time. Therefore, representative measurements have been studied for this report from 456 - 462 Bury Old Rd, Prestwich taken from KR Associates report Ref: KR01808 dated 22nd April 2010. The measurement location is 0.7miles from the proposed site and is good representative location. (See Figure 3.2). Due to the date of the measurements, we also studied the road noise measurements from the England Noise and Air Quality Viewer (see Figures 3.2.1 and 3.2.2) and we have used the worst-case scenario.



Figure 3.2 –Representative Test Location- 456 - 462 Bury Old Rd, Prestwich.

	Measurement Location
	Proposed Site

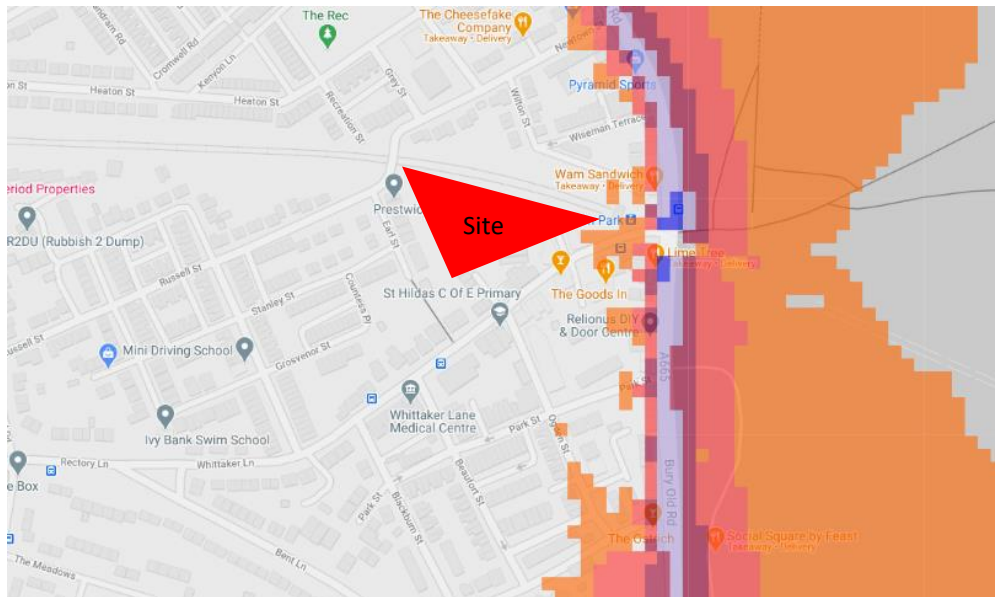
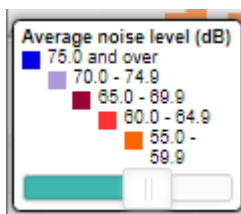


Figure 3.2.1 – The England Road Noise Viewer LAeq 16 (Day)



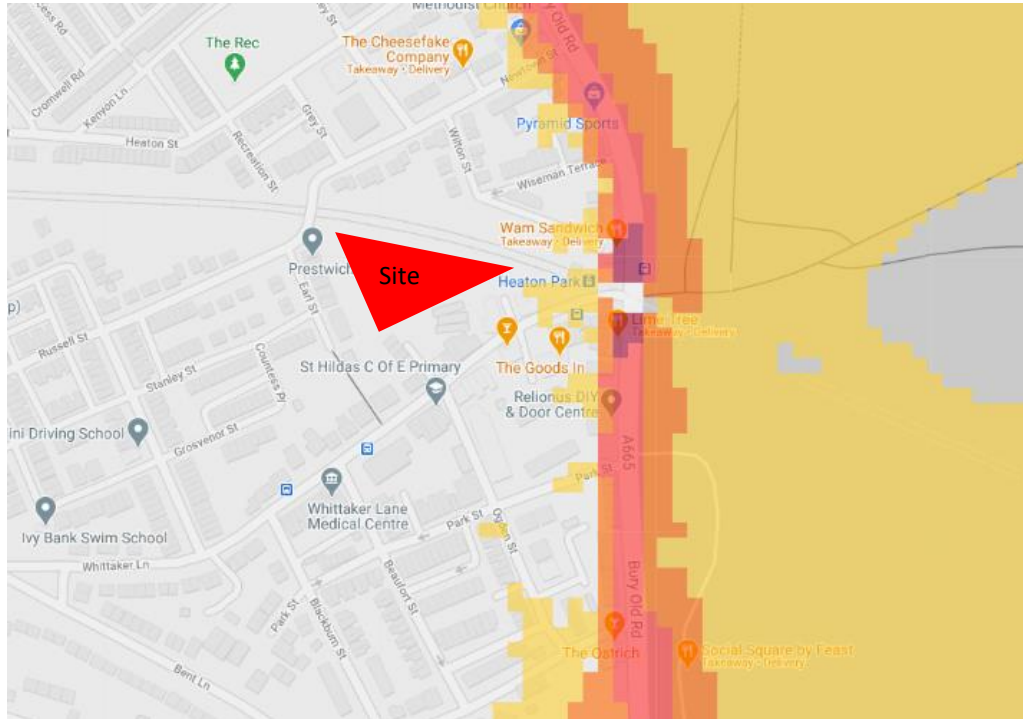
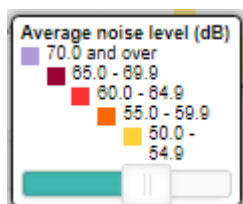


Figure 3.2.2 – The England Road Noise Viewer LAeq 8 (Night)





4.0 NOISE SURVEY

The highest representative daytime and night-time LAeq period levels have been used to form the basis of the calculations. These have also been summarised in table 4.1 below.

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Location	LAeq (15) (07:00 — 23:00)	LAeq (15) (23:00 - 07:00)
456 - 462 Bury Old Rd, Prestwich	50dB	36dB
The England Noise Viewer	55dB	50dB

Table 4.1 Field Levels

5.0 EXTERNAL BUILDING FABRIC

5.1 NON-GLAZED ELEMENTS

It is currently assumed that the non-glazed external building fabric elements of the proposed development would be comprised of blockwork. This would contribute towards a significant reduction of ambient noise levels in combination with a good quality secondary-glazed window configuration, as shown in Section 5.2.

All non-glazed elements of the building facades have been assumed to provide a sound reduction performance of at least the figures shown in Table 5.1 when tested in accordance with BS EN ISO 140-3:1995.

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Element	Octave Band Centre Frequency SRI, dB					
	125	250	500	1K	2K	4K
Non Glazed Element SRI	41	43	48	50	55	55

Table 5.1 Non-glazed elements assumed sound reduction performance

5.2 SPECIFICATION OF GLAZED UNITS

Sound reduction performance calculations have been undertaken in order to specify the minimum performance required from glazed elements in order to achieve 'good' internal noise levels shown in Appendix A, taking into account maximum noise levels monitored during the environmental noise survey.

In order that windows may remain closed to maintain the internal noise levels, an attenuated means of background ventilation will be required. It is understood that the apartments will be ventilated using MVHR units and so no trickle vents are required.

The minimum sound reduction index (SRI) value required for the glazed elements to be installed is shown in Table 5.2.

Glazing Configuration – 4mm/ (6-16mm) 4mm							
Frequency, Hz/dB					Rw	Rw+C	Rw + Ctr
125	250	500	1K	2K	29	28	25
21	17	25	35	37			

Table 5.2 – Minimum required Glazing Performance – Living Areas/Bedrooms

The sound reduction performance stated above must be achieved by the glazing system as a whole in its installed condition. The specification therefore applies to both the glazing element and all seals on any openable part of the system. It should be confirmed with any supplier that the full glazing system supplied complies with the requirements stated in Table 5.2.

5.3 VENTILATION

Mid Octave Feq (Hz)	125	250	500	1K	2K	Dn,e,w
Acoustic Trickle Vent (dB)	22	25	28	29	26	23 (open)

**Data based on Dne,w values provided for a non-acoustic trickle vent.

Note that the glazing and ventilation specifications are for guidance only. Similar products to those used in DAA Group calculations may achieve a similar level of sound reduction however this should be verified by the manufacturer.

6.0 CALCULATION RESULTS

Monitoring Period	Calculated Internal Noise Levels	Noise Criteria
07:00 – 23:00	26 dB LAeq(16hr)	35 dB
23:00 – 07:00	21 dB LAeq(8hr)	30 dB

Table 5.3 –Internal Noise Levels LAeq Calculations

7.0 OUTDOOR AMENITY

ProPG: Planning & Noise 3.10 Design Noise Levels for External Amenity Spaces BS8233:2014 (Section 7.7.3.2 Design criteria for external noise) contains the following additional guidance:

“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 LAeq,T, with an upper guideline value of 55 dB LAeq,T which would be acceptable in noisier environments.”

With the ‘worse-case scenario ‘ of 55db, the outdoor amenity noise levels are acceptable. However, with the addition of fencing, this will create some noise mitigation to lower the noise levels to a more desirable level.



8.0 SUMMARY AND CONCLUSIONS

A Noise Impact Assessment has been carried out at Earl Street, Prestwich. M25 1GQ to assess the suitability of the site for the change of use for the extension and re-development of the existing former nursery building on site to create four new dwellings and the construction of 13 No. new dwellings

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Due to Covid-19, representative measurements have been used for this report.

The measured levels have been assessed against the National Planning Policy Framework and currently available standards and guidance documents including World Health Organisation Guidelines for Community Noise (1999), BS8233:2014 Guidance on sound Insulation and noise and Bury Council Local Plan.

Appropriate external and internal noise criteria have been considered to minimise adverse impacts on health and quality of life as a result of the new development.

It is concluded that there are no further reasons, on noise grounds, why the relevant planning conditions should not be discharged provided the above points are taken into consideration.

APPENDIX A – CALCULATIONS

BS8233 CALCULATIONS OF NOISE BREAK-IN - 26dB LAeq(16hr) – Living Area

1	Room Width	4	Area	38.4	$L_{eq,2}$	26
2	Room Height	2.4	RT	0.5		
3	Room Depth	4	A	12.3648	S	53
4			A_0	10		
5	Mid-Octave Freq (Hz)	125	250	500	1k	2k
6	$L_{eq,ff}$	52	50	47	41	39
7	Vent $D_{n,e}$	22	25	28	29	26
8	$(A_0/S) * 10(-D_{n,e}/10)$	0.00119	0.00060	0.00030	0.00024	0.00047
9		S_{wi}	3			
10	Window R_{wi}	21	17	25	35	37
11	$(S_{wi}/S) * 10(-R_{wi}/10)$	0.00045	0.00113	0.00018	0.00002	0.00001
12		S_{ew}	25			
13	Wall R_{ew}	41	43	48	50	55
14	$(S_{ew}/S) * 10(-R_{ew}/10)$	0.00004	0.00002	0.00001	0.00000	0.00000
15		S_{rr}	25			
16	Roof R_w	37	42	45	50	56
17	$(S_{it}/S) * 10(-R_{it}/10)$	0.00009	0.00003	0.00001	0.00000	0.00000
18	Internal SPL	33.5	31.5	23.0	14.3	14.9
19	A-Weighting	-16.1	-8.6	-3.2	0	1.2
20	A-Weighted levels	17.4	22.9	19.8	14.3	16.1
21		55.0	196.0	95.8	26.6	40.8

BS8233 CALCULATIONS OF NOISE BREAK-IN - 21dB LAeq(8hr) – Bedroom

1 Room Width	4	Area	38.4	L _{eq,2}	21
2 Room Height	2.4	RT	0.5		
3 Room Depth	4	A	12.3648	S	53
4		A ₀	10		
5 Mid-Octave Freq (Hz)	125	250	500	1k	2k
6 L _{eq,ff}	47	45	42	36	34
7 Vent D _{n,e}	22	25	28	29	26
8 (A ₀ /S)*10(-D _{n,e} /10)	0.00119	0.00060	0.00030	0.00024	0.00047
9	S _{wi}	3			
10 Window R _{wi}	21	17	25	35	37
11 (S _{wi} /S)*10(-R _{wi} /10)	0.00045	0.00113	0.00018	0.00002	0.00001
12	S _{ew}	25			
13 Wall R _{ew}	41	43	48	50	55
14 (S _{ew} /S)*10(-R _{ew} /10)	0.00004	0.00002	0.00001	0.00000	0.00000
15	S _{rr}	25			
16 Roof R _w	37	42	45	50	56
17 (S _{rr} /S)*10(-R _w /10)	0.00009	0.00003	0.00001	0.00000	0.00000
18 Internal SPL	28.5	26.5	18.0	9.3	9.9
19 A-Weighting	-16.1	-8.6	-3.2	0	1.2
20 A-Weighted levels	12.4	17.9	14.8	9.3	11.1
21	17.4	62.0	30.3	8.4	12.9

APPENDIX B - ACOUSTIC TERMINOLOGY

B.1 WEIGHTED DECIBEL, dB(A)

The unit generally used for measuring environmental, traffic or industrial noise is the A-weighted sound pressure level in decibels, denoted dB(A). The weighting is based on the frequency response of the human ear and has been found to correlate well with human subjective reactions to various sounds. An increase or decrease of approximately 10 dB corresponds to a subjective doubling or halving of the loudness of a noise, and a change of 2 to 3 dB is subjectively barely perceptible.

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B.2 EQUIVALENT CONTINUOUS SOUND LEVEL, L_{Aeq}

Another index for assessment for overall noise exposure is the equivalent continuous sound level, L_{Aeq} . This is a notional steady level which would, over a given period, deliver the same sound energy as the actual time-varying sound over the same period.

B.3 MAXIMUM NOISE LEVEL, L_{Amax}

The maximum noise level identified during a measurement period. Experimental data has shown that the human ear does not generally register the full loudness of transient sound events of less than 125 ms in duration.

B.4 NOISE RATING, NR

Noise ratings are used as a single figure criterion for specifying services noise in buildings. Each noise rating value has an associated spectrum of defined values in each third or octave frequency band. To determine the noise rating of a room the measured spectrum is compared to a set of noise rating curves. The highest NR curve that crosses any single frequency band of the measurement determines the noise rating for the room.

The single figure noise rating is read at the 1 kHz band.

B.5 SOUND LEVEL DIFFERENCE (D)

The sound insulation required between two spaces may be determined by the sound level difference needed between them. A single figure descriptor which characterises a range of frequencies, the weighted sound level difference, D, is sometimes used (BS EN ISO 717-1). This parameter is not adjusted to reference conditions.

The standardized level difference, D_n , T is a measure of the difference in sound level between two rooms, in each frequency band, where the reverberation time in the receiving room has been normalised to 0.5 s. This parameter measures all transmission paths, including flanking paths.

The weighted standardized level difference, D_{nTw} , is a measure of the difference in sound level between two rooms, which characterises a range of frequencies and is normalised to a reference reverberation time

B.6 SOUND REDUCTION INDEX (R)

The sound reduction index (or transmission loss) of a building element is a measure of the loss of sound through the material, i.e. its attenuation properties. It is a property of the component, unlike the sound level difference which is affected by the common area between the rooms and the acoustic of the receiving room. The weighted sound reduction index, R_w , is a single figure description of sound reduction index characterising a range of frequencies, which is defined in BS EN ISO 717-1: 1997. The R_w is calculated from measurements in an acoustic laboratory

B.7 STATISTICAL NOISE LEVELS ($L_{A90, (T)}$, $L_{A1, (T)}$, $L_{A10, (T)}$ etc.)

For levels of noise that vary widely with time, for example road traffic noise, it is necessary to employ an index which allows for this variation. The L_{A10} is the level exceeded for ten per cent of the time under consideration, has historically been

adopted in the UK for the assessment of road traffic noise. The L_{A90} is the level exceeded for ninety per cent of the time, has been adopted to represent the background noise level. The L_{A1} the level exceeded for one per cent of the time, is representative of the maximum levels recorded during the sample period. A weighted statistical noise levels are denoted $L_{A10, dB}$, $L_{A90, dB}$ etc. The reference time (T) is normally included, e.g. $L_{A10, (5min)}$, & $L_{A90, (8hr)}$.

B.8 TYPICAL NOISE LEVELS

Typical noise levels are given in the following table.

Noise Level dB(A)	Example
130	Threshold of pain
120	Jet aircraft take-offs at 100 m
110	Chain saw at 1 m
100	Inside disco
90	Heavy lorries at 5 m
80	Kerbside of busy street
70	Loud radio (in typical domestic room)
60	Office or restaurant
50	Domestic fan heaters at 1m
40	Living room
30	Ventilation Noise in Theatre Remote countryside on still night Sound insulated test chamber
~	Threshold of hearing.