



Connell Co-op College, Manchester

Noise Assessment

5th March 2021

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CONTENTS

1.	INTRODUCTION	5
1.1.	OVERVIEW	5
1.2.	SCOPE AND OBJECTIVES	5
2.	LEGISLATION AND POLICY FRAMEWORK	6
2.1.	NATIONAL POLICY	6
2.2.	BRITISH STANDARDS AND ASSESSMENT CRITERIA	9
3.	SITE DESCRIPTION	12
3.1.	SITE AND SURROUNDING AREA	12
3.2.	PROPOSED DEVELOPMENT OVERVIEW	12
4.	MEASUREMENTS	13
4.1.	GENERAL	13
4.2.	WEATHER CONDITIONS	14
4.3.	SOUND INDICES AND PROCEDURE	14
4.4.	EQUIPMENT	14
4.5.	SOUND SURVEY RESULTS	15
5.	NOISE ASSESSMENT	16
5.1.	PLAYGROUND NOISE ASSESSMENT	16
5.2.	STATIC PLANT LIMITS	19
6.	CONCLUSION	20
7.	APPENDICES	21
7.1.	APPENDIX A – DEFINITION OF TERMS	22

FIGURES

FIGURE 1: SITE PLAN	12
FIGURE 2: MEASUREMENT POSITION	13
FIGURE 3: PLAYGROUND NOISE EMISSIONS	17

TABLES

TABLE 1: SIGNIFICANCE CRITERIA FROM NPPG IN ENGLAND: NOISE	8
TABLE 2: GUIDELINE VALUES FOR COMMUNITY NOISE IN SPECIFIC ENVIRONMENTS	10
TABLE 3: IMPACT SCALE FOR COMPARISON OF FUTURE NOISE AGAINST EXISTING NOISE	11
TABLE 4: MEASUREMENT POSITION DESCRIPTION	13
TABLE 5: INVENTORY OF SOUND MEASUREMENT EQUIPMENT	14
TABLE 6: BACKGROUND SOUND MEASUREMENT RESULTS	15
TABLE 7: PREDICTED SPECIFIC SOUND LEVELS AT THE NEAREST NOISE SENSITIVE RECEPTORS	17
TABLE 8: PREDICTED CHANGE IN EVENING AMBIENT SOUND LEVEL AT RECEPTOR	18
TABLE 9: ASSESSMENT AGAINST WHO GUIDELINES	18
TABLE 10: PROPOSED STATIC PLANT NOISE EMISSION LIMITS – RESIDENTIAL RECEPTORS	19
TABLE 11: TYPICAL SOUND LEVELS FOUND IN THE ENVIRONMENT	23

1. INTRODUCTION

1.1. Overview

inacoustic has been commissioned to assess the impact of noise from a proposed educational development site at Connell Co-op College, Manchester, Alan Turing Way, Manchester, M11 3BS.

The following technical noise assessment has been produced to provide supporting information to accompany a planning application to Manchester City Council and is based upon environmental noise measurements undertaken at the site.

It is understood that Environmental Health have recommended planning conditions, should the proposal be approved, which relate to noise breakout from the site; these conditions are pre-commencement and pre-occupation conditions, so therefore do not form part of this noise assessment.

This noise assessment is necessarily technical in nature; therefore a glossary of terms is included in Appendix A to assist the reader.

1.2. Scope and Objectives

The scope of the noise assessment can be summarised as follows:

- A sound monitoring survey was undertaken at a discrete location around the Site;
- A detailed assessment of the suitability of the Site, in accordance with relevant standards in respect of sound from the existing sources
- A 3-dimensional noise modelling exercise, in order to quantify the potential noise generation of the proposed site uses; and
- Recommendation of mitigation measures, where necessary, to comply with the requirements of the National Planning Practice Guidance in England: Noise¹, and BS4142:2014+A1:2019².

¹ Department for Communities and Local Government (DCLG), 2019. National Planning Practice Guidance for England. DCLG.

² British Standard 4142: 2014+A1:2019 *Methods for rating and assessing industrial and commercial sound*. BSI

2. LEGISLATION AND POLICY FRAMEWORK

The development proposals for the Site are guided by the following policy directives and guidance:

2.1. National Policy

2.1.1. National Planning Policy Framework, 2019

The *National Planning Policy Framework* (NPPF)³ sets out the Government's planning policies for England. Planning policy requires that applications for planning permission must be determined in accordance with the development plan, unless material considerations indicate otherwise.

The NPPF is also a material consideration in planning decisions. It sets out the Government's requirements for the planning system and how these are expected to be addressed.

Under Section 15; *Conserving and Enhancing the Natural Environment*, in Paragraph 170, the following is stated:

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

- e) preventing both 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".*

Paragraph 180 of the document goes on to state:

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

- a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;*
- b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason."*

As stated above, this document makes reference to avoiding noise generation from new developments that would adversely impact on health and quality of life. Paragraph 180 refers to the Noise Policy Statement for England, which is considered overleaf.

³ Ministry of Housing, Communities & Local Government. February 2019. National Planning Policy Framework. HMSO. London.

2.1.2. Noise Policy Statement for England, 2010

The underlying principles and aims of existing noise policy documents, legislation and guidance are clarified in *DEFRA: 2010: Noise Policy Statement for England* (NPSE)⁴. The NPSE sets out the “*Long Term Vision*” of Government noise policy as follows:

“Promote good health and good quality of life through the effective management of noise within the context of Government policy on sustainable development”.

The NPSE outlines three aims for the effective management and control of environmental, neighbour and neighbourhood noise:

- *“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 guidance states that it is not possible to have a single objective noise-based measure that defines “*Significant Observed Adverse Effect Level (SOAEL)*” that is applicable to all sources of noise in all situations and that not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available.

2.1.3. National Planning Practice Guidance in England: Noise, 2019

Further guidance in relation to the NPPF and the NPSE has been published in the *National Planning Practice Guidance in England: Noise* (NPPG Noise)⁵, which summarises the noise exposure hierarchy, based on the likely average response. The following three observed effect levels are identified below:

- **Significant Observed Adverse Effect Level:** This is the level of noise exposure above which significant adverse effects on health and quality of life occur;
- **Lowest Observed Adverse Effect Level:** This is the level of noise exposure above which adverse effects on health and quality of life can be detected; and
- **No Observed Adverse Effect Level:** This is the level of noise exposure below which no effect at all on health or quality of life can be detected.

⁴ Department for Environment, Food and Rural Affairs (DEFRA), 2010. Noise Policy Statement for England. DEFRA.

⁵ Department for Communities and Local Government (DCLG), 2019. National Planning Practice Guidance for England: Noise. DCLG.

Criteria related to each of these levels are reproduced in Table 1.

TABLE 1: SIGNIFICANCE CRITERIA FROM NPPG IN ENGLAND: NOISE

Perception	Examples of Outcomes	Increasing Effect Level	Action
No Observed Effect Level			
Not Noticeable	No Effect	No Observed Effect	No specific measures required
No Observed Adverse Effect Level			
Noticeable 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			
Noticeable 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

2.2. British Standards and Assessment Criteria

2.2.1. BS4142:2014+A1:2019

BS4142:2014+A1:2019 sets out a method to assess the likely effect of sound from factories, industrial premises or fixed installations and sources of an industrial nature in commercial premises, on people who might be inside or outside a dwelling or premises used for residential purposes in the vicinity.

The procedure contained in BS4142:2014+A1:2019 for assessing the effect of sound on residential receptors is to compare the measured or predicted sound level from the source in question, the $L_{Aeq,T}$ 'specific sound level', immediately outside the dwelling with the $L_{A90,T}$ background sound level.

Where the sound contains a tonality, impulsivity, intermittency and other sound characteristics, then a correction depending on the grade of the aforementioned characteristics of the sound is added to the specific sound level to obtain the $L_{A,r,Tr}$ 'rating sound level'. A correction to include the consideration of a level of uncertainty in sound measurements, data and calculations can also be applied when necessary.

BS4142:2014+A1:2019 states: *"The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs"*. An estimation of the impact of the specific sound can be obtained by the difference of the rating sound level and the background sound level and considering the following:

- *"Typically, the greater this difference, the greater the magnitude of the impact."*
- *"A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context."*
- *"A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context."*
- *"The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context."*

During the daytime, the assessment is carried out over a reference time period of 1-hour and 15 minutes during the night. The periods associated with day or night, for the purposes of the Standard, are considered to be 07.00 to 23.00 and 23.00 to 07.00, respectively.

2.2.2. World Health Organisation: Guidelines on Community Noise

The World Health Organisation (WHO) document 'Guidelines for Community Noise', sets out guidance as to noise levels at which there will be an unacceptable impact on the local community. This guidance considers many different types of noise sources. In paragraph 4.3.1 the impact of noise on dwellings is considered.

The document states that:

"Community noise (also called environmental noise, residential noise or domestic noise) is defined as noise emitted from all sources except noise at the industrial workplace. Main sources of community noise include road, rail and air traffic, industries, construction and public work, and the neighbourhood. Typical neighbourhood noise comes from premises and installations related to the

catering trade (restaurant, cafeterias, discotheques, etc.); from live or recorded music; sport events including motor sports; playgrounds; car parks; and domestic animals such as barking dogs."

This includes "sport events" and as such the use of playground sites.

The WHO guidelines state that to protect the majority of people from being seriously annoyed during the daytime (0700 – 2300), the sound pressure level on balconies, terraces and outdoor living areas should not exceed 55 dB L_{Aeq} for a steady, continuous noise. To protect the majority of people from being moderately annoyed during the daytime, the outdoor sound pressure level should not exceed 50 dB L_{Aeq} .

These guidelines are typically adopted and applied to various noise sources with the criteria that noise levels at nearby noise sensitive receivers during the daytime (0700 – 2300) should not exceed 50 dB(A). This target is seen to be appropriate for the sports pitches. The significance relative to National Planning Policy, interpreting this guidance, with consideration of the guidance given in the NPSE and NPPG Noise, has also been identified.

TABLE 2: GUIDELINE VALUES FOR COMMUNITY NOISE IN SPECIFIC ENVIRONMENTS

Specific Environment	Health Effect	$L_{Aeq(T)}$ dB(A)	NPPG Noise Significance
Outdoor Living Area	Serious Annoyance, Daytime and Evening	55	SOAEL
	Moderate Annoyance, Daytime and Evening	50	LOAEL
Dwelling Indoors	Speech intelligibility & moderate annoyance, daytime & evening	35	LOAEL

Therefore, where noise levels from the proposed development do not exceed 50 $L_{Aeq(T)}$ dB externally and 35 $L_{Aeq(T)}$ dB internally the effect is below the Lowest Observed Adverse Effect Level and will have no adverse effect. The noise level of the playground and MUGA may be noticeable but not intrusive and is considered acceptable in planning terms.

The equivalent noise level is determined over a specific time period. The World Health Organisation guidelines for residential development are typically equivalent noise levels calculated over a 16-hour daytime period. In our opinion a playground 16-hour assessment period may not truly reflect the noise impact as it takes into account times of use and non-use. We would propose an alternative, more stringent but appropriate assessment time period of one hour, $L_{Aeq(1 \text{ hour})}$, as this is the typical time period for a community sports session on a playground.

Therefore we would suggest the more stringent target noise level of 50 dB $L_{Aeq(1 \text{ hour})}$ is more suitable for the more sensitive evening time.

2.2.3. Relative Change in Ambient Noise Level

In circumstances where a noise environment may be altered by addition or removal of a noise source, considered to be largely anonymous or within the prevailing acoustic character of an area, it is normal to consider the relative change in ambient noise level. The assessment, therefore, considers this phenomenon.

The impact scale adopted in this assessment is shown in Table 3 below, which relates to established human responses to noise. The significance relative to National Planning Policy, interpreting this guidance, with consideration of the guidance given in the NPSE and NPPG Noise, has also been identified.

TABLE 3: IMPACT SCALE FOR COMPARISON OF FUTURE NOISE AGAINST EXISTING NOISE

Noise Level Change dB(A)	Subjective Response	Significance	NPPG Noise Significance
0	No change	No Impact	NOEL
0.1 – 2.9	Barely perceptible	Minor Impact	NOAEL
3.0 – 5.9	Noticeable	Moderate Impact	LOAEL
6.0 – 9.9	Up to a doubling or halving of loudness	Substantial Impact	SOAEL
10.0 or more	More than a doubling or halving of loudness	Major Impact	UAEL

The criteria above reflect the key benchmarks that relate to human perception of sound. A change of 3 dB(A) is generally considered to be the smallest change in environmental noise that is perceptible to the human ear. A 10 dB(A) change in noise represents a doubling or halving of the noise level. The difference between the minimum perceptible change and the doubling or halving of the noise level is split to provide greater definition to the assessment of changes in noise level.

It is considered that the criteria specified in Table 3 provide a good indication as to the likely significance of changes in noise levels in this case and have been used to assess the impact of noise from the playground.

4. MEASUREMENTS

4.1. General

The location at which background sound measurements have been undertaken were chosen on the basis of being representative of the nearest noise-sensitive properties to the Proposed Development.

The background sound measurements were carried out in accordance with BS4142:2014+A1:2019.

Attended background sound measurements were conducted during a typical midweek morning period at one location representative of the nearest noise sensitive properties to the Site, on 4th November 2020 between 10:00am-11:00am.

The measurement location is discussed below in Table 4, with an aerial photograph indicating its location shown overleaf in Figure 2.

TABLE 4: MEASUREMENT POSITION DESCRIPTION

Measurement Position	Description
MP1	A free-field measurement of noise at the nearest noise sensitive properties. The microphone was located at a height of 1.5 metres above ground level. The ambient sound environment was influenced by road traffic noise from the nearby roads.

FIGURE 2: MEASUREMENT POSITION



4.2. Weather Conditions

The background sound survey was conducted with wind speeds of less than 5 ms^{-1} , and there were no periods of precipitation during the sound survey. Which was determined during the attended period.

4.3. Sound Indices and Procedure

4.3.1. Background

The background sound measurements were undertaken at a microphone height of 1.5 metres above local ground level, away from reflecting surfaces, other than the ground, with a windshield used throughout. The measurements were carried out using a 5-minute sampling duration.

The parameters reported are the statistical indices $L_{A10,T}$ and the Background Sound Level, $L_{A90,T}$, as well as the Equivalent Continuous Sound Level, $L_{Aeq,T}$ and the Maximum Sound Pressure Level, L_{AFmax} . An explanation of the sound units presented is given in Appendix A.

4.4. Equipment

The sound measurement exercise was undertaken by a consultant certified as competent in environmental sound monitoring, and, in accordance with the principles of BS 7445⁶ and following the guidance given in BS4142:2014+A1:2019.

The acoustic measurement equipment used during the sound survey conformed to Type 1 specification of British Standard 61672⁷. A full inventory of this equipment is shown in Table 5 below:

TABLE 5: INVENTORY OF SOUND MEASUREMENT EQUIPMENT

Make, Model & Description	Serial Number
Rion NL-32 Sound Level Meter	01213696
Rion NH-21 Preamplifier	36327
Rion UC-53A Microphone	318715
Cirrus CR:515 Acoustic Calibrator	80029

The sound measurement equipment used during the survey was field calibrated at the start and end of the measurement period. A calibration laboratory has calibrated the field calibrator used within the twelve months preceding the measurements. A drift of less than 0.1 dB in the field calibration was found to have occurred on the sound level meter. The microphone was fitted with a protective windshield for the entire measurement period.

⁶ British Standard 7445: 2003: *Description and measurement of environmental noise*. BSI

⁷ British Standard 61672: 2013: *Electroacoustics. Sound level meters. Part 1 Specifications*. BSI.

4.5. Sound Survey Results

4.5.1. Background

The summarised results of the environmental noise measurements, during the daytime period, can be seen below in Table 6.

TABLE 6: BACKGROUND SOUND MEASUREMENT RESULTS

Measurement Position	Period	Noise Level, dB			
		L _{Aeq}	L _{AFmax}	L _{A10}	L _{A90}
MP1	Day 10:00-11:00	55.8	74.6	58.7	47.7

5. NOISE ASSESSMENT

5.1. Playground Noise Assessment

5.1.1. Assessment Methodology & Approach

The methodology adopted for this assessment has been based on determining a representative baseline noise climate for the nearest noise-sensitive receptors to the Proposed Development, and assessing the impact of the proposed playground on those receptors.

The predictions have been carried out using the noise-modelling suite iNoise 2021. In addition to the source noise levels used in the predictions, the model also considers the effects of the topographical conditions throughout the area, ground absorption, atmospheric absorption, acoustic reflections, acoustic screening.

5.1.2. Background Information

An assessment has been carried out using historical source data to determine the effect of noise on the nearest noise sensitive receptors and to ascertain the real noise levels emitting from the pitch and determine whether the noise emissions from the proposed development fall within acceptable limits of the assessment methods discussed in Section 2.2.2 and 2.2.3 it is necessary to predict the noise levels that are likely to occur as a result of the anticipated use of the proposed development.

Source data, relating to noise generation from sports fields has been taken from our accumulated archive and is set out below:

- Human child voice shouting: L_w 82.6 dB(A) per student.

The sound power level of the voice shouting has been modelled as an area source, the size of the pitch and at 1.5m in height from the ground and the L_w has then been scaled to match the 'Sports England AGP (Artificial Grass Pitch) Acoustics Design Notes' guidance of 58dB $L_{Aeq,(1hr)}$ at 10m from the side of the playground area.

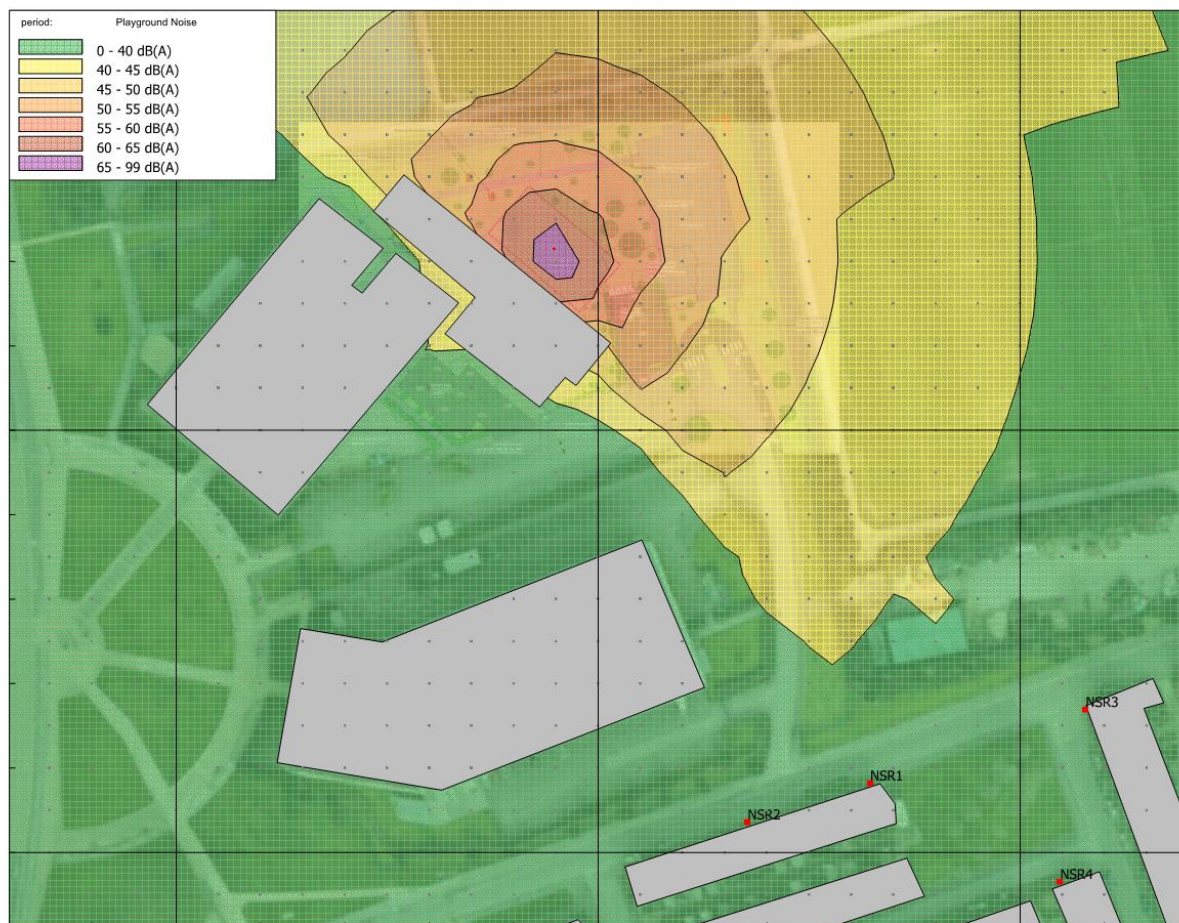
Noise levels from such developments are likely to be highly variable. This data set is viewed as a robust basis for the assessment, providing reasonable worst-case noise generation statistics, which are repeatable.

Predictions of received noise levels have been undertaken at the closest receptor points along Wilson Street to the South of the Site.

5.1.3. Prediction of Playground

The graphical representation of the noise emissions associated with the Playground as calculated using iNoise, can be seen in Figure 3 below.

FIGURE 3: PLAYGROUND NOISE EMISSIONS



The predicted specific sound level contributions from the proposed playground can be seen below in Table 7.

TABLE 7: PREDICTED SPECIFIC SOUND LEVELS AT THE NEAREST NOISE SENSITIVE RECEPTORS

Location	Predicted Specific Sound Level dB(A)
NSR1	34.8
NSR2	22.5
NSR3	38.6
NSR4	36.0

5.1.4. Relative Change in Ambient Noise Level Assessment

An assessment of the likely relative change in noise levels has been undertaken in accordance with standard good acoustic practice, based on the predicted levels set out in Table 7.

Table 8 presents the assessment of potential relative changes in noise from the proposed playground at the closest receptor.

TABLE 8: PREDICTED CHANGE IN EVENING AMBIENT SOUND LEVEL AT RECEPTOR

Activity Location	Modelled Specific Noise Level - $L_{Aeq,1-hour}$ dB	Current Ambient Sound Level $L_{Aeq,T}$ dB	Predicted Future Ambient Sound Level - $L_{Aeq,T}$ dB	Change in Ambient Sound Level - dB (Modelled/ Measured)
NSR1	34.8	55.8	55.8	0.0
NSR2	22.5	55.8	55.8	0.0
NSR3	38.6	55.8	55.9	+0.1
NSR4	36.0	55.8	55.8	0.0

The assessment detailed in Table 8 above identifies that under worst-case, peak use conditions, noise impacts from the operation of the playground might cause between *No Impact* and a *Minor Impact* on the nearest noise sensitive receptors.

5.1.5. Assessment Against Who Guidelines

Based on the guidance provided in Section 2.2.2, the noise levels within gardens and outdoor amenity areas should not normally exceed 50 dB(A) during the day (0700 – 2300). The noise map shown in Figure 3 clearly shows that over a 60-minute period, the noise contribution of the playground does not exceed the WHO guidelines limit of 50 dB(A). The results can be seen below in Table 9.

TABLE 9: ASSESSMENT AGAINST WHO GUIDELINES

Location	Modelled Specific Noise Level - $L_{Aeq,1-hour}$ dB	WHO Guideline Limits for Outdoors - (07:00-23:00) $L_{Aeq,16-hour}$ dB	Exceedance Over Who Guidelines - dB (Modelled/ Measured)
NSR1	34.8	50	-15.2
NSR2	22.5	50	-27.5
NSR3	38.6	50	-11.4
NSR4	36.0	50	-14.0

The results of this assessment indicate that impact of noise would result in a NOEL when compared to the NPPG noise significance guidance.

5.2. Static Plant Limits

The exact details of any static plant to be installed as part of the development are not currently known, therefore, for the purposes of this noise assessment, it is considered appropriate to set a plant noise emission limit in accordance with the requirements of BS4142:2014+A1:2019, which can be incorporated into a planning condition, to be discharged at a later date.

On this basis, any future static plant should be designed to achieve the rating noise level of 5 dB below the background sound level during the daytime periods, as shown in Table 10.

TABLE 10: PROPOSED STATIC PLANT NOISE EMISSION LIMITS – RESIDENTIAL RECEPTORS

Period	Proposed Plant 'Rating Noise Level' at the Nearest Residential Receptor – dB(A)
Day (07:00 – 23:00)	43

The above limits would apply to the total noise emission level from all plant within the proposed development. Individual plant items may need to be designed to a lower limit such that the overall total achieves the stated criteria above.

6. CONCLUSION

inacoustic has been commissioned to assess the impact of noise from a proposed educational development site at Connell Co-op College, Manchester, Alan Turing Way, Manchester, M11 3BS.

This technical noise assessment has been produced to provide supporting information to accompany a planning application to Manchester City Council and is based upon environmental noise measurements undertaken at the site.

In light of the above, it is considered that noise should not present a constraint to the granting of planning permission for the development of the site, subject to a suitably worded planning condition.

7. APPENDICES

7.1. Appendix A – Definition of Terms

Sound Pressure	Sound, or sound pressure, is a fluctuation in air pressure over the static ambient pressure.
Sound Pressure Level (Sound Level)	The sound level is the sound pressure relative to a standard reference pressure of 20µPa (20x10 ⁻⁶ Pascals) on a decibel scale.
Decibel (dB)	A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds s1 and s2 is given by 20 log ₁₀ (s1 / s2). The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is 20µPa.
A-weighting, dB(A)	The unit of sound level, weighted according to the A-scale, which takes into account the increased sensitivity of the human ear at some frequencies.
Noise Level Indices	Noise levels usually fluctuate over time, so it is often necessary to consider an average or statistical noise level. This can be done in several ways, so a number of different noise indices have been defined, according to how the averaging or statistics are carried out.
$L_{eq,T}$	A noise level index called the equivalent continuous noise level over the time period T. This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded.
$L_{max,T}$	A noise level index defined as the maximum noise level during the period T. L_{max} is sometimes used for the assessment of occasional loud noises, which may have little effect on the overall L_{eq} noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
$L_{90,T}$	A noise level index. The noise level exceeded for 90% of the time over the period T. L_{90} can be considered to be the "average minimum" noise level and is often used to describe the background noise.
$L_{10,T}$	A noise level index. The noise level exceeded for 10% of the time over the period T. L_{10} can be considered to be the "average maximum" noise level. Generally used to describe road traffic noise.
Free-Field	Far from the presence of sound reflecting objects (except the ground), usually taken to mean at least 3.5m
Facade	At a distance of 1m in front of a large sound reflecting object such as a building façade.
Fast Time Weighting	An averaging time used in sound level meters. Defined in BS 5969.

In order to assist the understanding of acoustic terminology and the relative change in noise, the following background information is provided.

The human ear can detect a very wide range of pressure fluctuations, which are perceived as sound. In order to express these fluctuations in a manageable way, a logarithmic scale called the decibel, or dB scale is used. The decibel scale typically ranges from 0 dB (the threshold of hearing) to over 120 dB. An indication of the range of sound levels commonly found in the environment is given in the following table.

TABLE 11: TYPICAL SOUND LEVELS FOUND IN THE ENVIRONMENT

Sound Level	Location
0dB(A)	Threshold of hearing
20 to 30dB(A)	Quiet bedroom at night
30 to 40dB(A)	Living room during the day
40 to 50dB(A)	Typical office
50 to 60dB(A)	Inside a car
60 to 70dB(A)	Typical high street
70 to 90dB(A)	Inside factory
100 to 110dB(A)	Burglar alarm at 1m away
110 to 130dB(A)	Jet aircraft on take off
140dB(A)	Threshold of Pain

The ear is less sensitive to some frequencies than to others. The A-weighting scale is used to approximate the frequency response of the ear. Levels weighted using this scale are commonly identified by the notation dB(A).

In accordance with logarithmic addition, combining two sources with equal noise levels would result in an increase of 3 dB(A) in the noise level from a single source.

A change of 3 dB(A) is generally regarded as the smallest change in broadband continuous noise which the human ear can detect (although in certain controlled circumstances a change of 1 dB(A) is just perceptible). Therefore, a 2 dB(A) increase would not be normally be perceptible. A 10 dB(A) increase in noise represents a subjective doubling of loudness.

A noise impact on a community is deemed to occur when a new noise is introduced that is out of character with the area, or when a significant increase above the pre-existing ambient noise level occurs.

For levels of noise that vary with time, it is necessary to employ a statistical index that allows for this variation. These statistical indices are expressed as the sound level that is exceeded for a percentage of the time period of interest. In the UK, traffic noise is measured as the L_{A10} , the noise level exceeded for 10% of the measurement period. The L_{A90} is the level exceeded for 90% of the time and has been adopted to represent the background noise level in the absence of discrete events. An alternative way of assessing the time varying noise levels is to use the equivalent continuous sound level, L_{Aeq} .

This is a notional steady level that would, over a given period of time, deliver the same sound energy as the actual fluctuating sound.

To put these quantities into context, where a receiver is predominantly affected by continuous flows of road traffic, a doubling or halving of the flows would result in a just perceptible change of 3 dB, while an increase of more than 25%, or a decrease of more than 20%, in traffic flows represent changes of 1 dB in traffic noise levels (assuming no alteration in the mix of traffic or flow speeds).

Note that the time constant and the period of the noise measurement should be specified. For example, BS 4142 specifies background noise measurement periods of 1 hour during the day and 15 minutes during the night. The noise levels are commonly symbolised as $L_{A90,1\text{hour}}$ dB and $L_{A90,15\text{mins}}$ dB. The noise measurement should be recorded using a 'FAST' time response equivalent to 0.125 ms.

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