



Noise Impact Assessment

Crabtree Lane, Openshaw

Reference: 50-392-R1-2

Date: July 2022



NOISE IMPACT ASSESSMENT

**Crabtree Lane,
Openshaw**

Prepared for:

MCI Developments

**Report Ref: 50-392-R1-2
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EXECUTIVE SUMMARY

BACKGROUND

Site Address	Crabtree Lane, Openshaw, Manchester M11 1AJ
National Grid Reference	E 388721 N 398031
Proposed Development	Planning application for 115 residential units comprising houses and apartments along with access and landscaping.
Report Objectives	To identify, measure and assess the potential impact of existing sound sources that have the potential to impact upon the proposed noise sensitive development. The report follows current and relevant British Standards in order to provide a robust assessment.

ASSESSMENT

Surveys Completed	Worst-case attended measurements of commercial sound have been undertaken during representative daytime and night-time periods in a position considered representative of the site. The main sound source was found to be activity associated with SGB which operates a scaffolding yard to the west of the Site. No commercial sound was noted from the units on the other side of the canal to the north.
Assessments	E3P has undertaken a BS4142:2014+A1:2019 assessment accounting for sound from SGB impacting upon the proposed development. The predicted rating level has been compared to the existing typical background sound level for the daytime periods within rear garden areas. Consideration is given to living room and bedroom noise levels in accordance with BS 8233:2014. Consideration has been given to any acoustic characteristics associated with SGB.
Mitigation Requirements	Whole dwelling ventilation is recommended for all plots along the western boundary so that residents need not open windows for background ventilation. Thermal comfort can be controlled by way of open windows without compromising reasonable internal noise levels. The client proposes to include for 1.8 m close boarded fences along garden edges on the eastern and western areas in order to provide a level of protection against potential noise from the school and industrial premises respectively. As such, E3P have recommended an appropriate specification.

CONCLUSIONS

The assessment has determined that, with mitigation measures in place, acceptable external and internal noise levels can be achieved at the proposed development. As such, no adverse impact is predicted.



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1. INTRODUCTION

1.1. BACKGROUND

E3P were commissioned by MCI Developments to undertake a Noise Impact Assessment for a proposed residential development on land off Crabtree Lane in Openshaw, to be referred to hereafter as '*the site*'.

This assessment looks to determine the key noise sources that have the potential to impact upon the development and undertake an assessment of any impacts upon noise sensitive receptors.

1.2. PROPOSED DEVELOPMENT

The Site is brownfield and within a mixed use area with commercial units to the north and west, a community school to the south east and residential dwellings bounding to the south.

The key sources of sound impacting upon the development is industrial/commercial sound associated with the SGB scaffolding business to the west which was found to operate from 06:00 to 17:00 and includes sound from Heavy Goods Vehicle (HGV) movements, movement of materials and vehicle movements.

The assessment has been undertaken in accordance with the following planning drawing:

 Proposed Site Layout (Rev E) dated June 2022.

1.3. LIMITATIONS

Where a noise or vibration survey is required to inform an assessment, E3P will endeavour to ensure that all noise and vibration measurements taken are robust, representative and reliable in order to inform an accurate assessment at the time.

E3P will endeavour to capture all existing and proposed sources of sound and vibration at the time of the surveys and/or assessments. However, should new sources of sound be introduced, existing sources modified/changed, or characteristics of the sound be altered following completion of such, E3P cannot be held accountable for this.

Where mitigation measures are specified in this report, it should be noted that these measures are relative to a specific sound or vibration source, both in terms of the measured sound pressure and vibration level and the character of the sound source. Where either the sound pressure level or the character of the sound varies following completion of the sound survey, E3P cannot be held responsible for any subsequent variations in the proposed mitigation performance, for either absolute levels or frequency content.



2. ASSESSMENT METHODOLOGY

2.1. NATIONAL PLANNING POLICY FRAMEWORK

To prevent unacceptable risks from pollution, planning policies and decisions should ensure that new development is appropriate for its location. The effects (including cumulative effects) of pollution on health, the natural environment or general amenity, and the potential sensitivity of the area or proposed development to adverse effects from pollution, should be considered.

The national planning policy framework states that planning policies and decisions should aim to:

- ✿ Avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development.
- ✿ Mitigate and reduce to a minimum, other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions.
- ✿ Recognise 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 because of changes in nearby land uses since they were established.
- ✿ Identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.

2.2. NATIONAL PLANNING PRACTICE GUIDANCE

Noise needs to be considered when new developments may create additional noise and when new developments would be sensitive to the prevailing acoustic environment. When preparing local or neighbourhood plans, or taking decisions about new development, there may also be opportunities to consider improvements to the acoustic environment.

Local planning authorities' plan-making and decision-making should take account of the acoustic environment and in doing so consider:

- ✿ Whether or not a significant adverse effect is occurring or is likely to occur.
- ✿ Whether or not an adverse effect is occurring or is likely to occur.
- ✿ Whether or not a good standard of amenity can be achieved.

In line with the explanatory note of the NPSE, this would include identifying whether the overall effect of the noise exposure (including the impact during the construction phase, where applicable) is, or would be, above or below the significant observed adverse effect level and the lowest observed adverse effect level for the given situation.



The “observed effect levels” are as follows:

-  **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.
-  **No observed effect level:** This is the level of noise exposure below which no effect at all on health or quality of life can be detected.

Table 2.1 summarises the noise exposure hierarchy, based on the likely average response.

TABLE 2.1 NOISE EXPOSURE HIERARCHY

PERCEPTION	EXAMPLES OF OUTCOMES	INCREASING EFFECT LEVEL	ACTION
Not Noticeable	No effect.	No observed effect	No specific measures required
Noticeable and Not Intrusive	Noise can be heard but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived 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 and/or attitude, e.g. turning up volume of television, speaking more loudly, or having to close windows for some of the time because of the noise where there is no alternative ventilation. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed adverse effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Noticeable and Disruptive	The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion, having to keep windows closed most of the time because of the noise where there is no alternative ventilation. 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	Avoid
Noticeable and Very Disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening, loss of appetite, significant/medically definable harm (auditory and non-auditory).	Unacceptable adverse effect	Prevent



The subjective nature of noise means that there is not a simple relationship between noise levels and the impact on those affected. This will depend on how various factors combine in any situation. These factors include the following:

- ✿ The source and absolute level of the noise together with the time of day it occurs. Some types and level of noise will cause a greater adverse effect at night than if they occurred during the day. The adverse effect can also be greater simply because there is less background noise at night.
- ✿ For non-continuous sources of noise, the number of noise events, and the frequency and pattern of occurrence of the noise can be important.
- ✿ The spectral content of the noise and the general character of the noise. The local topology and topography should also be considered along with the existing and, where appropriate, the planned character of the area.

More specific factors to consider when relevant:

- ✿ Where applicable, the cumulative impacts of more than one source should be considered along with the extent to which the source of noise is intermittent and of limited duration.
- ✿ Consideration should also be given to whether adverse internal effects can be completely removed by closing windows and, in the case of new residential development, if the proposed mitigation relies on windows being kept closed most of the time. In both cases, a suitable alternative means of ventilation is likely to be necessary.
- ✿ If external amenity spaces are an intrinsic part of the overall design, then the acoustic environment of those spaces should be considered so that they can be enjoyed as intended.

2.3. BS 4142: 2014+A1:2019 'METHODS FOR RATING AND ASSESSING INDUSTRIAL AND COMMERCIAL SOUND'

This standard describes methods for rating and assessing sound of an industrial or commercial nature which includes:

- ✿ Sound from industrial and manufacturing processes.
- ✿ Sound from fixed installations which comprise mechanical and electrical plant and equipment.
- ✿ Sound from the loading and unloading of goods and materials at industrial and / or commercial premises; and
- ✿ Sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from processes or premises, such as that from forklift trucks, or that from train or ship movements on or around an industrial or commercial Site.

The procedure detailed in the standard compares the measured or predicted specific noise level from any of the above with the background sound level at a residential dwelling. The measured background sound level at a receptor should be reliable and should not necessarily ascertain a lowest measured background sound level, but rather to quantify what is typical.

The specific noise level also acknowledges the reference time intervals depending upon whether the noise source operates during daytime (1-hour) or night-time (15-minute) periods.



There are several 'penalties' which can be attributed to the specific sound level depending upon the 'acoustic features' of the sound level under investigation as follows:

Tonality

-  +2 dB: where the tonality is just perceptible.
-  +4 dB: where the tonality is clearly perceptible; and
-  +6 dB: where the tonality is highly perceptible.

Impulsivity

-  +3 dB: where the impulsivity is just perceptible.
-  +6 dB: where the impulsivity is clearly perceptible; and
-  +9 dB: where the impulsivity is highly perceptible.

Intermittency

-  +3dB: where the intermittency is readily distinctive against the acoustic environment.

In addition to the above, there is a penalty for 'other sound characteristics' of +3 dB where a sound exhibits characteristics that are neither tonal nor impulsive, though are readily distinctive against the acoustic environment. BS 4142 goes on to state that the rating level is equal to the specific sound level if there are no such features present or expected to be present.

Assessment of the rating level relative to the background sound level can yield the following commentary:

-  Typically, the greater this difference (between the rating level and the background sound level), the greater the magnitude of impact.
-  A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
-  A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context; and
-  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. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact.

It is common that a Local Planning Authority (LPA) will specify their own criterion and, where this is the case, this criterion will usually take precedence over a simple comparison of the rating level against the background sound level.



2.4. BRITISH STANDARD BS 8233:2014 – GUIDANCE ON SOUND INSULATION AND NOISE REDUCTION FOR BUILDINGS

2.4.1. NOISE CRITERIA LIMITS

The scope of this standard is the provision of recommendations for the control of noise in and around buildings including residential dwellings. It suggests appropriate criteria and limits for different situations, which are primarily intended to guide the design of new buildings or refurbished buildings undergoing a change of use, rather than to assess the effect of changes in the external noise climate.

The standard suggests suitable internal noise levels within different types of buildings, including residential dwellings, as shown in Table 2.2.

TABLE 2.2 BS 8233:2014 RECOMMENDED INTERNAL NOISE LEVELS

CRITERION	TYPICAL SITUATION	DESIGN CRITERION, $L_{Aeq,T}$ (dB)
Suitable Resting and Sleeping Conditions	Living Room	35
	Bedroom	30

BS 8233 goes on to recommend noise levels for gardens:

It is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments. However, it is also recognised that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors might be warranted.

BS 8233 goes on to say:

In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces but should not be prohibited.

2.4.2. VENTILATION REQUIREMENTS

Where a partially open window cannot be relied upon to provide an adequate level of façade sound insulation performance, it is necessary to consider alternative ventilation for habitable rooms. Section 8.4.5.4 within BS 8233 states:

The Building Regulations' supporting documents on ventilation [48, 49, 50] recommend that habitable rooms in dwellings have background ventilation. Where openable windows cannot be relied upon for this ventilation, trickle ventilators can be used and sound attenuating types are available. However, windows may remain openable for rapid or purge ventilation, or at the occupant's choice.

Alternatively, acoustic ventilation units (see 7.7.2 below) are available for insertion in external walls. These can provide sound reduction comparable with double glazed windows. However, ducted systems with intakes on the quiet side of the building might be required in very noisy situations, or where appearance rules out through-the-wall fans.



Section 7.7.2 states:

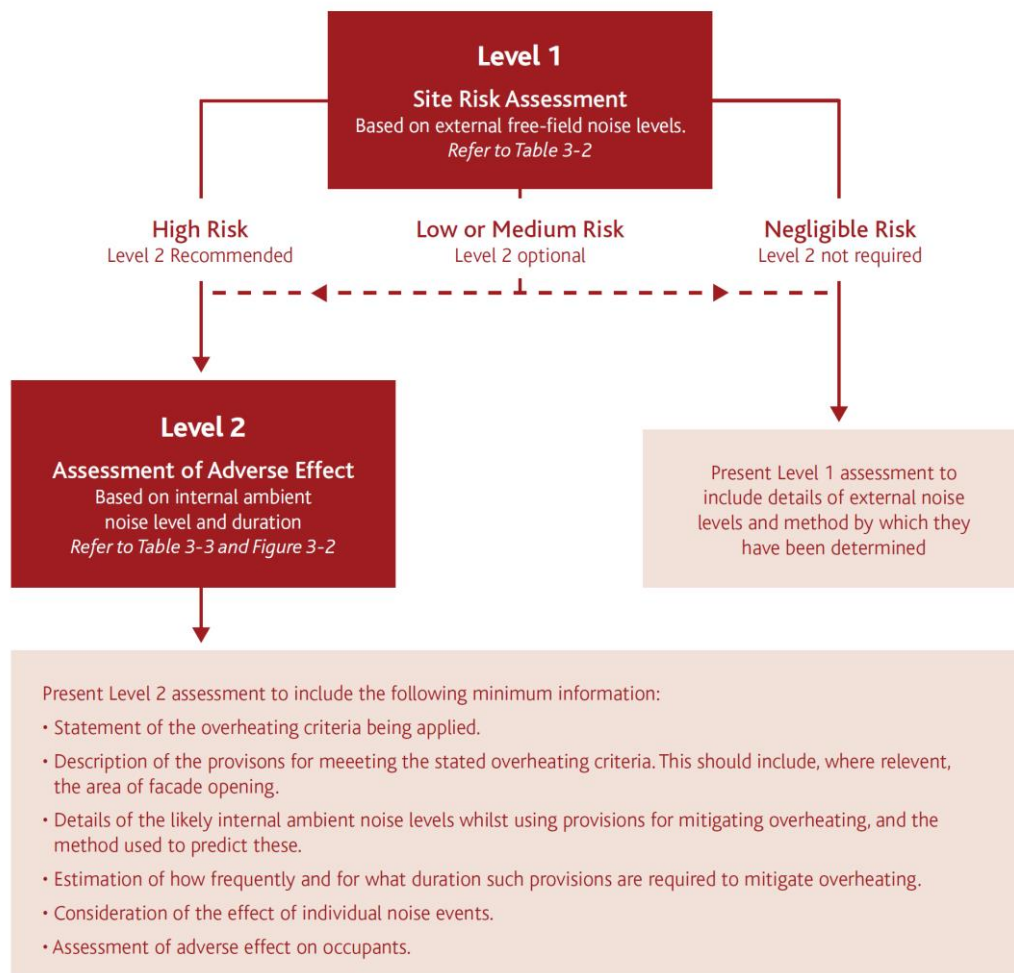
NOTE 5 If relying on closed windows to meet the guide values, there needs to be an appropriate alternative ventilation that does not compromise the façade insulation or the resulting noise level.

2.5. INSTITUTE OF ACOUSTICS AND ASSOCIATION OF NOISE CONSULTANTS (2020) ACOUSTICS VENTILATION AND OVERHEATING: RESIDENTIAL DESIGN GUIDE

The Acoustics Ventilation and Overheating (AVO) Residential Design Guide provides an approach as to how the competing aspects of thermal and acoustic comfort can be managed. The AVO Guide aims to assist designers to adopt an integrated approach to the acoustic design within the context of the ventilation and thermal comfort requirements.

The AVO Guide provides a method for assessing the impact of opening windows and providing whole house ventilation due to the impact of noise via a two-level noise assessment procedure, as below:

DIAGRAM 2.1 TWO LEVEL NOISE ASSESSMENT PROCEDURE – OVERHEATING CONDITION



A level 1 risk assessment is based on external free-field noise levels with the assumption of a partially opened window in use for mitigation of overheating. A level 1 assessment is appropriate for scenarios where the risk to a development is deemed 'Negligible'. 'Low' and 'Medium' risk sites only require a level 2 assessment on an optional basis in order to give further confidence in the suitability of internal noise conditions. The noise levels suggested in Table 2.3 and 2.4 assume a steady road traffic noise source but can be adapted for other transport sources.

TABLE 2.3 GUIDANCE FOR LEVEL 1 SITE RISK ASSESSMENT OF NOISE FROM TRANSPORT NOISE SOURCES RELATING TO OVERHEATING CONDITION

RISK CATEGORY FOR LEVEL 1 ASSESSMENT - EXTERNAL		RISK LEVEL	POTENTIAL EFFECT WITHOUT MITIGATION	RECOMMENDATION FOR LEVEL 2 ASSESSMENT
L_{Aeq,T} during 07:00 - 23:00	L_{Aeq,8hr} during 23:00 - 07:00			
≥65dB	≥55dB	High	Increasing risk of adverse effect	Recommended
>55 dB and <63 dB	>45 and <55 dB	Medium		Optional
>50dB and <55 dB		Low		
≤50 dB	≤45 dB	Negligible	Use of opening window as means of mitigating overheating is not likely to result in adverse effect	Not Required

A level 2 assessment will be carried out when the risk of adverse effect is 'High' or it is deemed appropriate for a 'low' or 'medium' risk site. An increase in internal ambient noise level can cause a change in human behaviour. At high levels this creates situations where occupants can no longer open windows for ventilation due to high external noise levels. A level 2 assessment identifies these situations and allows for appropriate alternative ventilation systems to be recommended.



TABLE 2.4 GUIDANCE FOR LEVEL 2 ASSESSMENT OF NOISE FROM TRANSPORT NOISE SOURCES RELATING TO OVERHEATING CONDITION

INTERNAL AMBIENT NOISE LEVEL AT FAÇADE LOCATIONS			EXAMPLE OF OUTCOMES
L_{Aeq,T} during 07:00 - 23:00	L_{Aeq,8hr} during 23:00 - 07:00	Individual noise events during 23:00 - 07:00	
>50 dB	>42 dB	Normally exceeds 65 dB L _{AF,max}	Noise causes a material change in behaviour e.g. having to keep windows closed most of the time
<i>Increasing noise levels</i>			Increasing the likelihood of impact on reliable speech communication during the day or sleep disturbance at night
≤35 dB	≤30 dB	Do not normally exceeds L _{AF,max} 45 dB more than 10 times a night	Noise can be heard but does not cause any change in behaviour



3. SURVEY RESULTS

3.1. SOUND CLIMATE

Whilst on site it was noted that the only potential source of sound was SGB to the west. Before and after the surveys below, the surveyor attended the northern site to determine whether any activity from the northern units were audible. However, at the time of the surveys, the units appeared to be closed or disused.

Other than commercial sound from SGB, other sources were noted to be distant road traffic and occasional movements along Crabtree Lane, birdsong and aircraft. Pedestrians along the canal were also noted to be a source of sound.

No sound was noted from the commercial premises to the south west with these also seeming to be closed/derelict.

It was not possible to access the south eastern corner of the site with the school. However, given the size of the school and from experience of other sites situated next to primary schools, the potential impact is not considered significant. Indeed, levels are likely to be below 50 dB from the play area. Furthermore, the client intends to include 1.8 m high close boarded fences along the edges of plots 16, 107 and 108 which would provide sufficient protection from any sound associated with children playing.

An area to the north east is noted with machinery stored within the confines but no activity noted on either day or attendance. This area is not as future development with a link to the site and so this area is not considered in the assessment.

3.2. ATTENDED SOURCE SOUND SURVEY

E3P have undertaken detailed measurements of all existing commercial operations surrounding the Site. The surveys were carried out over the following time periods:

- 📍 Tuesday 28th September 2021 between 05:45 and 10:00; and
- 📍 Wednesday 29th September 2021 between 12:00 and 15:30

Background sound levels were measured concurrently when no activity from nearby commercial premises was noted.

E3P undertook a site walkover during each period and noted that the only commercial sound audible was that from SGB to the west. The units to the north appeared derelict with no noise noted at 05:40, 10:05, 11:55 and 15:40.

The measurements were undertaken at the following position:

- 📍 Noise Measurement Position 1 (NMP1) – Located on the western edge of Crabtree Lane approximately 2 m from palisade fencing associated with SGB. The microphone of the sound level meter was located at a height of 1.5 m above local ground level in free-field conditions. Sound sources consisted of HGV movements, moving of materials in the yard and vehicle movements.



FIGURE 1 NOISE MEASUREMENT POSITION



Table 3.1 details the hourly measured noise levels for the above measurement position and dominant sound sources for the entire measurement periods undertaken. Measurements were completed with a sampling period of 20 ms to allow post analysis of the noise levels.



TABLE 3.1 MEASURED SOURCE NOISE LEVELS

TIME PERIOD	DOMINANT SOURCE	MEASURED SOURCE NOISE LEVEL, $L_{Aeq,T}$ (dB)	MEASURED RESIDUAL NOISE LEVEL, $L_{Aeq,T}$ (dB)	LOWEST MEASURED BACKGROUND SOUND LEVEL, L_{A90} (dB)
05:45-06:00	Running water from canal, distant road traffic	-	49.3	47.5
06:00-06:15	Road traffic and birdsong	-	49.0	47.9
06:15-06:30	Material movement at SGB	50.2	49.0	48.6
06:30-06:45	Road traffic and aircraft	-	50.4	49.0
06:45-07:00		-	50.4	48.9
07:00-08:00	HGVs and material movement at SGB, birdsong	52.2	50.9	48.9
08:00-09:00	Material movement at SGB	52.5	50.9	49.2
09:00-10:00	HGVs and material movement at SGB, birdsong	52.9	51.4	49.1
12:00-13:00	HGVs and material movement at SGB	53.8	52.1	50.3
13:00-14:00	HGVs and material movement at SGB	54.7	52.2	50.7
14:00-15:00	HGVs and material movement at SGB, birdsong	54.3	51.8	50.1

The levels highlighted in bold in the Table are used to inform the assessment.

During the survey, conditions remained dry and wind speeds rarely exceeded 10 mph.

The equipment outlined in Table 3.2 was used for the noise survey.

TABLE 3.2 NOISE MEASUREMENT EQUIPMENT AND CALIBRATION DATES

MEASUREMENT POSITION	EQUIPMENT DESCRIPTION	MANUFACTURER & TYPE NUMBER	SERIAL NUMBER	CALIBRATION DUE DATE
All NMPs	Sound Level Meter	01dB Fusion	12039	30th June 2023
	Pre-amplifier	01dB Pre22	1805124	
	Microphone	GRAS 40CE	330832	
	Calibrator	01dB Cal31	87281	3rd February 2022



The sound level meter was field calibrated on site using the above-mentioned calibrator prior to and after noise measurements were taken. No significant drift was witnessed as noted above. Calibration certificates are available upon request.



4. NOISE IMPACT ASSESSMENT

The assessment considers the potential impact of commercial sound upon proposed receptors during daytime and night-time periods.

For the BS 4142:2014+A1:2019 assessments, penalties are applied to the specific sound level in order to provide the rating level. These penalties relate to the acoustic features of the sound source. Accordingly, the following subjective features have been accounted for in the assessment, in accordance with the subjective method detailed in BS 4142:2014+A1:2019, for the units as a whole operation.

TABLE 4.1 ACOUSTIC PENALTIES

SOURCE	CHARACTERISTIC	ATTRIBUTABLE PENALTY	COMMENT
SGB	Tonality	-	No tonality detected.
	Impulsivity	-	No impulsivity detected during on site measurements.
	Intermittency	3 dB	Unloading/loading activities and movement of material are intermittent in nature
	Other Sound Characteristics	-	Other penalties applied.

4.1. DAYTIME ASSESSMENT

Table 4.2 details the BS 4142 assessment for receptors along the western boundary. The highest ambient noise level is used to inform the assessment with reasonable assumptions made on operational on-times for the source.



TABLE 4.1 WORST-CASE DAYTIME BS 4142 ASSESSMENT – CLOSEST RECEPTORS

RESULTS		RELEVANT CLAUSE	COMMENTARY
Measured ambient sound level	54.7 dB $L_{Aeq,1hr}$	7.1 7.3 7.3.6	Source consisted of materials/items being moved within the yard and HGV movements and reverse alarms.
Residual sound level	52.2 dB $L_{Aeq,16hr}$	7.3.3 7.3.5	Residual sound was noted to be road traffic and birdsong.
Background sound level	49 dB $L_{A90,1hr}$	8.1.3 8.3 8.4 8.5	E3P have taken the lowest measured 15 minute background sound level during the daytime period when no source was noted to inform a worst-case assessment.
Assessment made during the daytime, so reference time interval is 1 hour		7.2	
Specific sound level	48 dB $L_{Aeq,1hr}$	7.3.4 7.3.5 7.3.6 7.3.7	Ambient sound level minus residual sound level. Time correction of -3 dB applied as source was only noted for up to 15 minutes at a time during the survey but this is doubled to inform a worst-case assessment (30 minute on-time).
Acoustic feature correction	3 dB	9.2	Penalty for intermittency applied.
Rating level	51 dB $L_{A,r}$	9.2	
Background sound level	$L_{A90,1hr} = 49$ dB	8	
Excess of rating over background sound level	(51 – 49) dB = 2 dB in excess	11	The closest proposed receptors that face SGB.
Assessment indicates likely indication of an adverse impact, depending on the context			
Uncertainty of the assessment	Not significant	10	The excess of the background sound level is considered marginally significant and in this instance the uncertainty of the measurement does not have any significance to the outcome of the assessment.

Table 4.2 indicates that the predicted rating level exceeds the background sound level by 2 dB. BS 4142 provides the following advice:

A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.

Given the 2 dB exceedance, the impact of commercial sound is not considered adverse. Indeed, rear gardens are fully shielded from the commercial units and so the above difference would not be experienced in these areas with at least 5 dB correction for partial line of sight removal to be applied. Furthermore, any exposed garden edges will benefit from 1.8 m high close boarded fences.



As such, no adverse impact is predicted in external areas. When considering internal areas, the highest measured 1-hour ambient noise level, residual plus specific, is used and considered robust to assess potential internal impact for worst-case periods and includes all sources of sound.

When considered standard thermal double glazing (4 / 20 / 4 providing 31 dB R_w), internal noise levels are considered acceptable and will likely be less than 25 dB. However, with windows open for background ventilation, levels are likely to be approximately 42 dB, some 7 dB in excess of the criterion. As such, a whole dwelling ventilation system is required for the following plots:

- ✳ Plots 1 to 8.
- ✳ 62 to 76; and
- ✳ 89 to 100 where habitable room windows are located on southern or western facades.

4.2. NIGHT-TIME ASSESSMENT

SGB was noted to operate prior to 07:00 with material movement and HGV movements noted between 06:20 and 07:00, albeit not very often and at a relatively low level compared to during the day.

As it is reasonable to assume that residents will be inside, asleep, during these periods, consideration to internal average and maximum noise levels is given.

The highest measured $L_{Aeq,15mins}$ was noted to be 50.2 dB. When considered standard thermal double glazing (4 / 20 / 4 providing 31 dB R_w), internal noise levels are considered acceptable and will likely be less than 19 dB. However, with windows open for background ventilation, levels are likely to be approximately 37 dB, some 7 dB in excess of the criterion. As such, a whole dwelling ventilation system is required for the following plots:

- ✳ Plots 1 to 8.
- ✳ 62 to 76; and
- ✳ 89 to 100 where habitable room windows are located on southern or western facades.

As well as average noise levels, consideration has been given to the maximum measured noise level, noted to be 71 dB $L_{Amax,fast}$ when activity was taking place. Maximum noise levels between 06:00 and 07:00 when no activity was noted ranged between 60.8 and 65.8 dB. When considered standard thermal double glazing, internal noise levels are considered acceptable and will likely be less than 40 dB. However, with windows open for background ventilation, levels are likely to be approximately 58 dB, some 13 dB in excess of the criterion. This does not differ from the above requirements but will dictate the performance of any window mounted or through wall ventilators.



5. MITIGATION MEASURES

5.1. ACOUSTIC BARRIERS

The previous section stated that acoustic barriers, at a height of 1.8 m, are proposed along exposed garden edges close to the school and the industrial area. As such, it is recommended that the following barriers be included in the design with acoustic specification which is outline dbelow:

- ✿ Plots 8 and 9.
- ✿ Plot 16.
- ✿ Plot 77.
- ✿ Plots 88 and 89.
- ✿ Plot 100.
- ✿ Plot 107; and
- ✿ Plot 108.

In order to provide sufficient noise attenuation, the barriers must be of close boarded design, be free from holes, sealed at the base and have a minimum mass of 10 kg/m².

5.2. FAÇADE INSULATION REQUIREMENTS

The previous section determined that a whole house ventilation system would be required for certain plots facing SGB that provides background ventilation without the need to mitigate overheating.

Standard thermal double glazing is sufficient for all plots.

Given the development is new build, it is assumed that System 1 ventilation, in accordance with the Building Regulations, would be installed as standard across all plots.

However, in order to ensure acceptable internal noise levels can be achieved in the affected plots, it is recommended that any through wall or window mounted trickle ventilators achieve the same reduction, as a minimum, as the glazing installed when in the open position. Where System 1 is not installed as standard, it must be installed, as a minimum, in the following plots:

- ✿ Plots 1 to 8.
- ✿ 62 to 76; and
- ✿ 89 to 100 where habitable room windows are located on southern or western facades.



6. CONCLUSION AND RECOMMENDATIONS

E3P were commissioned by MCI Developments to undertake a Noise Impact Assessment for a residential development on land off Crabtree Lane in Openshaw.

This assessment looked to determine the key noise sources in the vicinity of the Site and undertake an assessment of any impacts upon proposed noise sensitive receptors.

Attended background and ambient sound surveys were undertaken during daytime and night-time periods in order to capture commercial sound from all surrounding uses. It was found that the only commercial sound present was due to SGB to the west. No noise, day or night, was noted from the northern units.

E3P has undertaken a detailed assessment of commercial sound in accordance with BS 4142:2014+A1:2019, at the closest proposed receptors to SGB.

The assessment has shown that the predicted rating levels during the daytime periods either fall below or slightly exceed the background sound level. However, considering the context of the site and that rear gardens are fully shielded from SGB, the exceedances are not considered significant.

However, during daytime and night-time periods within habitable rooms, internal noise levels could be exceeded should windows be opened for ventilation. As such, a whole dwelling ventilation system is required for plots 1 to 8, and 63 to 108.

This assessment has shown that there should be no adverse impact upon residential receptors due to existing commercial sound should the mitigation measures be installed. As such, noise should not be a determining factor in the determination of the planning application.

END OF REPORT



APPENDIX I

GLOSSARY OF ACOUSTIC TERMINOLOGY

NOISE

Noise is defined as unwanted sound. Human ears are able to respond to sound in the frequency range 20 Hz (deep bass) to 20,000 Hz (high treble) and over the audible range of 0 dB (the threshold of perception) to 140 dB (the threshold of pain). The ear does not respond equally to different frequencies of the same magnitude but is more responsive to mid-frequencies than to lower or higher frequencies. To quantify noise in a manner that approximates the response of the human ear, a weighting mechanism is used. This reduces the importance of lower and higher frequencies, in a similar manner to the human ear.

Furthermore, the perception of noise may be determined by a number of other factors, which may not necessarily be acoustic. In general, the impact of noise depends upon its level, the margin by which it exceeds the background level, its character and its variation over a given period of time. In some cases, the time of day and other acoustic features such as tonality or impulsiveness may be important, as may the disposition of the affected individual. Any assessment of noise should give due consideration to all of these factors when assessing the significance of a noise source. The most widely used weighting mechanism that best corresponds to the response of the human ear is the "A"-weighting scale. This is widely used for environmental noise measurement, and the levels are denoted as dB(A) or L_{Aeq} , L_{A90} etc., according to the parameter being measured.

The decibel scale is logarithmic rather than linear, and hence a 3 dB increase in sound level represents a doubling of the sound energy present. Judgement of sound is subjective but, as a general guide, a 10 dB(A) increase can be taken to represent a doubling of loudness, whilst an increase in the order of 3 dB(A) is generally regarded as the minimum difference needed to perceive a change under normal listening conditions. An indication of the range of sound levels commonly found in the environment is given in the following table.

TABLE A1 TYPICAL SOUND PRESSURE LEVELS

SOUND PRESSURE LEVEL	LOCATION/EXAMPLE
0	Threshold of hearing
20–30	Quiet bedroom at night
30–40	Living room during the day
40–50	Typical office
50–60	Inside a car
60–70	Typical high street
70–90	Inside a factory
100–110	Burglar alarm at 1 m away
110–130	Jet aircraft on take off
140	Threshold of pain



ACOUSTIC TERMINOLOGY

TABLE A2 TERMINOLOGY

DESCRIPTOR	EXPLANATION
dB (decibel)	The scale on which sound pressure level is expressed. It is defined as 20 times the logarithm of the ratio between the root-mean-square pressure of the sound field and a reference pressure (2E-05 Pa).
dB(A)	A-weighted decibel. This is a measure of the overall level of sound across the audible spectrum with a frequency weighting (i.e. "A" weighting) to compensate for the varying sensitivity of the human ear to sound at different frequencies.
L_{Aeq, T}	L _{Aeq} is defined as the notional steady sound level which, over a stated period of time (T), would contain the same amount of acoustical energy as the A-weighted fluctuating sound measured over that period.
L_{Amax}	L _{Amax} is the maximum A-weighted sound pressure level recorded over the period stated. L _{Amax} is sometimes used in assessing environmental noise where occasional loud noises occur, 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.
L₁₀ and L₉₀	If a non-steady noise is to be described, it is necessary to know both its level and the degree of fluctuation. The L _n indices are used for this purpose, and the term refers to the level exceeded for n% of the time. Hence L ₁₀ is the level exceeded for 10% of the time and as such can be regarded as the "average maximum level". Similarly, L ₉₀ is the "average minimum level" and is often used to describe the background noise. It is common practice to use the L ₁₀ index to describe traffic noise.
Free-field Level	A sound field determined at a point away from reflective surfaces other than the ground with no significant contributions due to sound from other reflective surfaces. Generally, as measured outside and away from buildings.
Fast	A time weighting used in the root-mean-square section of a sound level meter with a 125-millisecond time constant.
Slow	A time weighting used in the root-mean-square section of a sound level meter with a 1000-millisecond time constant.

