

London office

1B(c) Yukon Road
London
SW12 9PZ
Tel: 0203 475 2280

Manchester office

Suite 34 Europa House
Barcroft Street
Bury BL9 5BT
Tel: 0161 850 2280

Hanson Springs

Gorrells Way, Rochdale

4 November 2024

19265-NIA-01

Noise Impact Assessment

Project Number
19265

Issued For
Hanson Springs Limited



EXECUTIVE SUMMARY

This noise impact assessment has been undertaken in order to assess proposals to construct a new storage building and add an extension to an existing building on the existing industrial site at Hanson Springs, Gorrells Way, Rochdale, leading to a potential intensification in the use of existing loading bays.

It is understood that the new storage areas will be used to facilitate a build up storage of product, such that Client requests can be more quickly responded to. The proposals may not necessarily lead to an increase in HGV trips to site, but onerous projections anticipate that up to 4 additional 2-way trips each day could result from the proposals.

The site operates between 06:00 and 18:30 Monday to Thursday and between 06:00 and 13:00 on Fridays. The site does not operate on weekends.

A background noise survey has been undertaken as detailed in the report, in order to determine an appropriate noise emission criterion for loading and unloading operations, in accordance with the requirements of British Standard 4142: 2014 +A1: 2019 '*Methods for rating and assessing industrial and commercial sound*'.

Calculations were undertaken for the nearest receiver, identified as a row of recently constructed residential houses on Broadbent Street, to the northwest of the industrial site. It should be noted that if there are closer receivers that Clement Acoustics is not aware of, a reassessment will be necessary, and this should therefore be confirmed by the Client.

It has been demonstrated that noise emissions from loading and unloading operations can be controlled to a level where a low impact assessment is achieved, based on the following material considerations:

- Proposed operations in terms of activities and durations are as stated in this assessment.
- Operation and receiver locations are as established in this assessment.
- A noise management plan is adopted, including certain measures as specified herein.

If there is any deviation from the above, Clement Acoustics must be informed, in order to establish whether a reassessment is necessary.

Clement Acoustics has used all reasonable skill and professional judgement when preparing this report. The report relies on the information as provided to us at the time of writing and the assumptions as made in our assessment.

This report is designed to be suitable to discharge typical noise planning conditions, as per our original scope of work. The report should not be relied upon for further reasons, such as the detailed design of mitigation measures.

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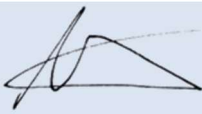
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Issue	Date of Issue	Author	Reviewed	Authorised
0	04/11/2024			
		Duncan Martin Director BSc (Hons) MIOA	John Smethurst Director BSc (Hons) MIOA	

Issue	Comment
0	First Issue

1.0 INTRODUCTION

Clement Acoustics has been commissioned by Hanson Springs Limited to measure existing background noise levels at Hanson Springs, Gorrells Way, Rochdale. Measured noise levels have been used to determine noise emissions criteria for proposed operations within an existing loading bay area, associated with a proposal to add a new storage building and extend an existing building on an industrial site.

Assessed activities comprise possible loading and unloading operations during night-time hours, and the resulting impact on residential houses located to the northwest of the site.

This report presents the results of the environmental survey followed by noise impact calculations and outlines any necessary mitigation measures.

An acoustic terminology glossary is provided in Appendix A.

2.0 SITE DESCRIPTION

The site is an existing industrial unit, with proposals to add a new storage building and extend an existing building. An existing loading area and associated access routes will be unchanged, but there is a possibility that the number of HGVs accessing the site could increase.

Figure 2.1 shows the site layout with the proposed new building highlighted turquoise and the building extension highlighted yellow. The loading areas have been marked in red and the HGV access route marked in purple.

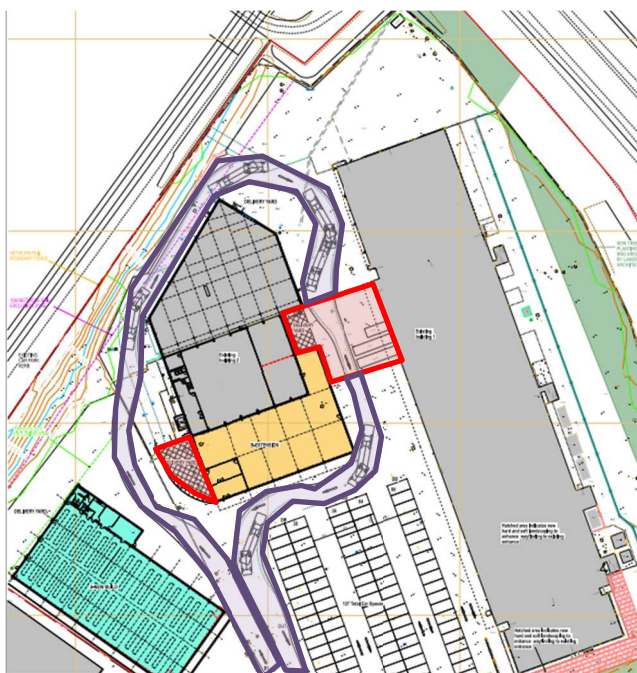


Figure 2.1 Plan views showing site layout

The development site is in a largely industrial/commercial area, with industrial units located to the southwest, southeast and northeast. A residential development is located to the northwest of the site, approximately 60 m from the closest point of the access route and 100 m from the loading areas.

The closest dwellings on Broadbent Street were identified through observations on-site. If there are any receivers closer than those identified within this report then a further assessment will need to be carried out. Therefore, the closest noise sensitive receiver should be confirmed by the Client before any works or noise mitigation measures are implemented.

Locations are shown in attached site plan 19265-SP1. It is noted that the residential development at Broadbent Street was under construction at the time the imagery used was captured.

2.1 Existing Operations

The site generally operates between 06:00 and 18:30 on Mondays to Thursdays and between 06:00 and 13:00 on Fridays. There are no operations on weekends.

A three-week survey of HGV trips was undertaken by security staff between 19 September 2024 and 11 October 2024, with a total of 11 working days surveyed.

HGV counts indicated that the number of daily 2-way trips varied between 4 and 14. The earliest HGV trip on the days surveys was between 07:00 and 07:30, and latest was between 17:00 and 17:30. The majority of trips occurred between 09:30 and 16:00.

2.2 Assessed Activity

Further to a discussion with the design team and site representatives, it is understood that the proposals are not expected to result in a significant increase in HGV trips and deliveries/collections. However, as a worst case, it is anticipated that up to 4 additional 2-way trips could result from the increase in storage capacity.

In order to provide an onerous assessment, it has been assumed that two new 2-way trips could occur in the same 15-minute period between 06:00 and 07:00, i.e. during night-time hours as defined in the standard.

Based on the existing trip time limits and distribution, this is expected to present a particularly robust assessment.

3.0 ENVIRONMENTAL NOISE SURVEY

3.1 Unattended Noise Survey Procedure

Measurements were undertaken at one position as shown on indicative site plan 19265-SP1. The choice of this position was based both on accessibility and on collecting representative noise data in relation to the nearest affected receiver.

The microphone was mounted on a pole on the northwestern site boundary, close to the boundary fence. The microphone was positioned away from any vertical reflective surface.

The position was considered to be free-field according to guidance found in British Standard 4142: 2014 +A1 2019 ‘Methods for rating and assessing industrial and commercial sound’ [BS 4142], and a correction for reflections has therefore not been applied.

Continuous automated monitoring was undertaken for the duration of the survey between 11:25 on 10 September 2024 and 11:10 on 12 September 2024.

The measurement procedure generally complied with ISO 1996-2: 2017: ‘Description, measurement and assessment of environmental noise’.

Road traffic noise from distant and local roads, and passing trains on a railway line adjacent to the site boundary were the main identified source of continuous, residual noise levels around the site. Some occasional noise from onsite operations were observed, although these would not be expected to influence night-time noise levels, which are the focus of this assessment.

3.2 Weather Conditions

Weather conditions were observed and noted during the set-up and collection of the monitoring equipment.

Wind speeds and temperatures were measured using a digital anemometer and thermometer, while other weather elements were determined through subjective observations.

The noted weather conditions are summarised in Table 3.1.

Wind Speed	Wind Direction	Temperature	Cloud Cover	Comments
Meter Set-Up [02/10/2024]				
4 m/s	W	11 °C	100 %	Dry and overcast
Meter Collection [04/10/2024]				
2 m/s	W	9 °C	60 %	Dry and partially cloudy

Table 3.1 Noted weather conditions during surveys

It is understood that the weather conditions during the unattended survey remained largely dry, with wind speeds below 5 m/s.

It is considered that the weather conditions were suitable for the measurement of environmental noise.

3.3 Equipment

The equipment calibration was verified, by means of a field verification check, before and after use and no abnormalities were observed.

The equipment used was as follows.

- 1 No. Svantek Type 958 Class 1 Sound Level Meter
- Norsonic Nor1251 Class 1 Calibrator

4.0 RESULTS

4.1 Unattended Noise Survey Results

The $L_{Aeq}: 5min$, $L_{Amax}: 5min$, $L_{A10}: 5min$ and $L_{A90}: 5min$ acoustic parameters were measured at the location shown in site drawing 19265-SP1.

It should be noted that the guidance of the latest revision of BS 4142, as detailed in Section 8.1 of the standard is as follows:

‘The objective is not simply to ascertain a lowest measured background sound level, but rather to quantify what is typical during particular time periods.’

Measured noise levels are shown as a time history in Figure 19265-TH1, with average ambient and typical background noise levels summarised in Table 4.1. The period between 05:00 and 07:00 has been included in the analysis, in order to present a representative background noise level for possible activities between 06:00 and 07:00, as discussed in Section 2.2.

Time Period	Average ambient noise level $L_{Aeq}: T$, dB	Typical background noise level L_{A90} : 5min, dB
Daytime (07:00 - 23:00)	60	56
Night-time (23:00 - 07:00)	53	45
Reference Period (05:00 - 07:00)	56	47

Table 4.1 Average ambient and typical background noise levels

5.0 NOISE CRITERIA

5.1 Local Authority Requirements

The Local Authority has stated the following in an initial response to the proposals:

“...if brought forward we would require a noise impact assessment to ensure the development does not have an adverse impact on existing noise sensitive receptors.”

5.2 Adopted Criteria for Loading/Unloading Operations

For the breakout of industrial noise from the loading and unloading operations to receivers, an assessment according to the guidance of BS 4142 has been adopted as per the requirements of the Local Authority as stated in Section 5.1 above.

In a BS 4142 assessment, corrections are applied to noise levels in order to calculate a noise rating level for the effects of proposed activities on nearby noise sensitive receivers. This calculated receiver noise level is compared with the typical measured background noise level.

BS 4142 recommends penalties that can be applied to noise emissions to account for tonality and intermittency. Where a sound source is neither tonal nor impulsive, but is still distinctive against the residual acoustic environment, a penalty may still be applied.

The available penalties for different characteristics are summarised in Table 5.1.

Characteristic	Comments	Maximum Penalty
Tonality	Can be converted to 2 dB for a tone which is just perceptible, 4 dB where it is clearly perceptible and 6 dB where it is highly perceptible	6 dB
Impulsivity	Can be converted to 3 dB for impulsivity which is just perceptible, 6 dB where it is clearly perceptible and 9 dB where it is highly perceptible	9 dB
Distinctiveness	Intended for sources that are neither tonal nor impulsive, but distinctive against background noise sources	3 dB
Intermittency	When the sound has identifiable on/off conditions	3 dB

Table 5.1 Available penalties according to BS 4142

BS 4142 states that a noise rating 5 dB above the background noise level is likely to be an indication of an adverse impact. If the difference is 10 dB or more, then this is stated as likely to be an indication of a significant adverse impact. Where the rating level does not exceed the background sound level, this is stated as an indication of the sound source having a low impact.

Calculated noise emissions will be assessed against the background sound levels shown in Table 4.1. Although the majority of loading operations have been observed to take place during the middle of working daytime hours (09:30 to 16:00) when background noise levels increase, the background noise levels between a reference period of 05:00 to 07:00 shown in Table 4.1 will be considered in order to present a robust assessment.

A 15-minute reference period has been used for the assessment of night-time operations that have been assumed could occur at this site, as required by BS 4142.

5.3 Consideration of L_{AFmax} Occurrences

The World Health Organisation (WHO) states that at night, sound pressure levels outside the facades of living spaces should not exceed L_{AFmax} 60 dB, so that people may sleep with windows open.

Maximum noise levels of proposed activities will be assessed against this stated criterion.

6.0 ASSESSMENT OF LOADING AND UNLOADING OPERATIONS

6.1 Anticipated Noise Sources

In terms of loading and unloading operations, the anticipated noise sources are as follows, based on the description of loading/unloading operations provided by the Client:

- HGVs travelling on access road
- HGV idling during loading/unloading
- Door slams (driver's door and tailgate etc)
- Cage movements in and around HGV
- Forklift movements around loading area

In order to establish anticipated levels of noise due to the operations, library data has been used, measured on previously assessed service yards. Descriptions of the measurements used in calculations and BS 4142 penalties deemed applicable are given in each case.

Anticipated noise emissions associated with the proposed loading and unloading operations are summarised in Table 6.1 where typical noise emission levels are shown.

Noise Source	Measured Sound Pressure Level (at stated distance)	Comments	Penalties
HGV Accessing Yard	L _{Aeq} 72 dB, at 10 m	Tipper truck pulling away	None
HGV Idling	L _{Aeq} 69 dB, at 3 m	7.5T refrigeration lorry	None
HGV Door Slam	L _{AFmax} 85 dB, at 3 m [Instantaneous]	-	Impulsivity 6 dB
Loading Bay, Cage Movements	L _{Aeq} 75 dB, at 3 m	5 sec measurement	Distinctiveness 3 dB
Forklift Movements	L _{Aeq} 76 dB, at 2 m	With audible reverse indicator	Tonality 6 dB

Table 6.1 Loading/unloading noise sources used in the assessment

The worst case assessment considers two HGVs each conducting a 2-way trip and associated loading activities during a single 15-minute period between 06:00 and 07:00.

A 15-minute assessment period has been constructed, comprising the noise sources as detailed in Table 6.2.

Activity	Location	Duration in 15 min Period	Comments
HGV Accessing Yard	Closest point of access road	4 mins total (2 mins at arrival position, 2 mins at departure position)	Allows for 1 minute travelling on the access road for each arrival/departure
HGV Idling	Service Yard	10 mins	5 minutes in each loading area, total of 10 mins
HGV Door Slam	Service Yard	10 secs	Total of 5 door slams for each HGV
Cage Movements	Service Yard	10 mins	5 minutes in each loading area, total of 10 mins
Forklift Movements	Service Yard	10 mins	5 minutes in each loading area, total of 10 mins

Table 6.2 15-Minute scenario for early morning loading

6.2 Construction of Noise Model

In order to provide an accurate and robust assessment of proposed loading and unloading activities, noise emissions have been considered by developing a noise map.

The noise model was constructed using the proprietary noise modelling software package CadnaA, utilising the following assumptions and parameters:

- Service yard noise modelled as a collection of point sources around the service yard area
 - Each operation noise level modelled and calibrated using the measured noise levels described in Section 6.1
 - Each noise source has the stated penalty for tonality/impulsivity/distinctiveness, as stated in Table 6.1, added on individually in the model
- Locations of obstacles
 - Offsite and onsite buildings
 - Intermediate railway embankment
- Presence of reflecting surfaces
 - All building facades are assumed to be reflective
- Ground Absorption
 - Service yard modelled as hard and reflective
 - Intermediate green areas modelled as absorptive
- Attenuation due to atmospheric absorption
- Receiver heights for houses are modelled at 4 m above ground (first floor windows)
- Receiver heights for apartment block are modelled at:
 - 4 m height (first floor windows)
 - 7 m height (second floor windows)
 - 10 m height (third floor windows)

It should be noted that all calculations in the CadnaA model, including those for distance and screening of intermediate building envelopes are undertaken according to International Standard ISO 9613-2:1996 '*Acoustics – Attenuation of sound during propagation outdoors. Part 2: General method of calculation*' [ISO 9613]. This standard is the preferred method stated in BS 4142 to minimise uncertainty.

6.3 BS 4142 Assessment

The specific noise level has been derived by the use of the 3D noise map model following the calculation method stated in ISO 9613. Calculations are performed over single octave bands from 63 Hz to 8 kHz.

Figure 6.1 shows a plan view of noise propagation from the site, towards the identified receptors, with all considered loading and unloading noise sources operational and with appropriate penalties applied.

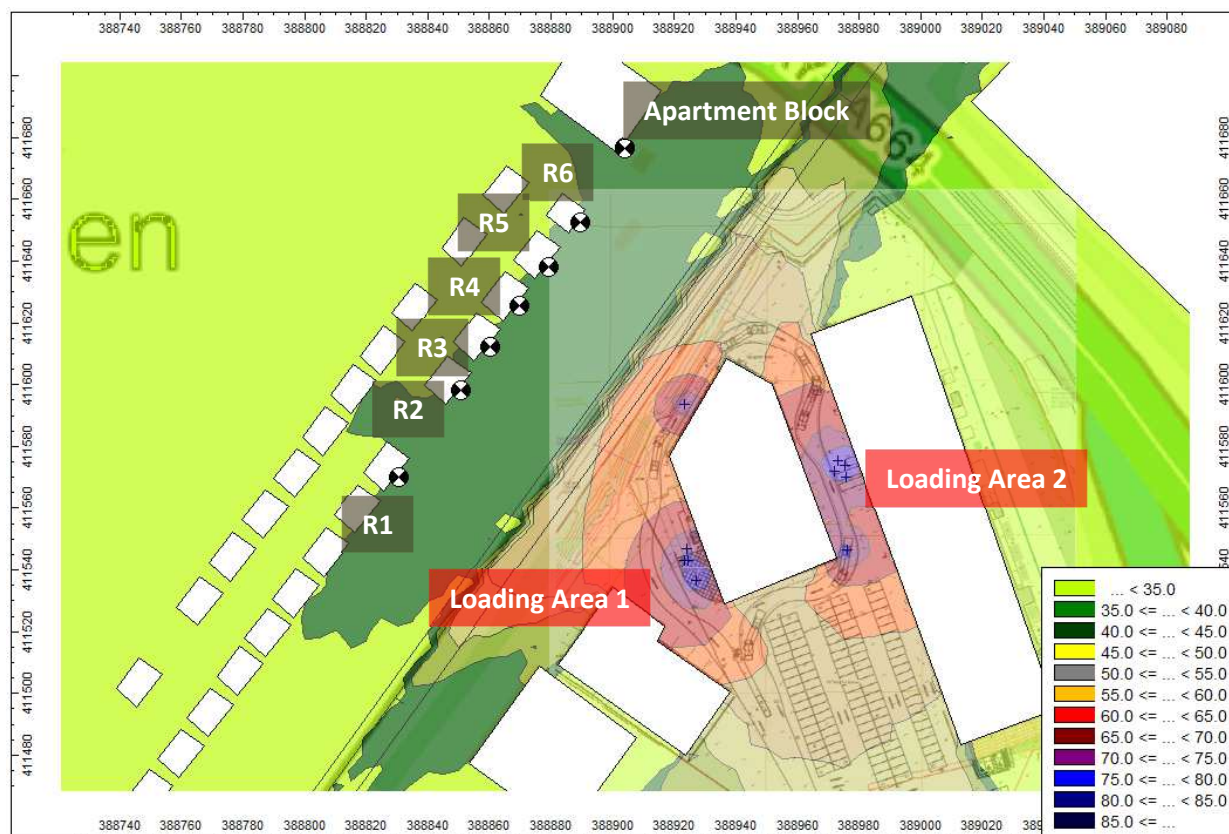


Figure 6.1 Plan view of noise propagation in 3D noise model

The closest receivers have been identified as residential houses and an apartment block on Broadbent Street, to the northwest of the site, approximately 60 m from the closest point of the access route and 100 m from the loading areas. Receivers have been placed at positions representative of the closest first floor windows (4 m above ground) at the houses, and at first, second and third floors of the apartment block.

Taking into account all necessary acoustic corrections, including BS 4142 penalties as described in Table 6.1, the resulting noise rating level at the identified residential windows would be as shown in Table 6.3.

Receiver	Calculated Noise Rating Level at Receiver $L_{Aeq,15min}$	Typical Measured Background Noise [05:00 to 07:00] $L_{A90,5mins}$	Difference
R1	36 dB(A)	47 dB(A)	-11 dB
R2	36 dB(A)		-11 dB
R3	36 dB(A)		-11 dB
R4	36 dB(A)		-11 dB
R5	36 dB(A)		-11 dB
R6	37 dB(A)		-10 dB
Apartments – 1 st Floor	38 dB(A)		-9 dB
Apartments – 2 nd Floor	42 dB(A)		-5 dB
Apartments – 3 rd Floor	46 dB(A)		-1 dB

Table 6.3 Noise levels and resulting differences at noise sensitive receivers

As shown in Table 6.3, noise emissions from the proposed operations are expected to be indicative of low impact. The impact does not reach the threshold of an adverse impact at any receiver.

6.3.1 Site Context

It is noted that the predicted impact is expected to be indicative of a low impact and does not reach the threshold of an adverse impact, and the site is an existing industrial use. The assessment has been based on particularly onerous scenario, in reality any increase in the number of HGV trips is expected to be minimal.

Further, the site is in an existing industrial area with numerous industrial warehouses and associated service yards in close proximity.

Therefore, given the nature and context of the site, an impact that does not reach the threshold of being adverse is expected to be considered acceptable.

6.3.2 Guidance of IEMA

‘Guidelines for Noise Impact Assessments: 2014’, published by the Institute of Environmental Management and Assessment (IEMA), gives guidance on describing the impact of noise based on the change in noise level as follows:

- Negligible: Assessment criterion is exceeded by 0 to 2.9 dB;
- Minor: Assessment criterion is exceeded by 3 to 4.9 dB;
- Moderate: Assessment criterion is exceeded by 5 to 9.9 dB; and

- Major: Assessment criterion is exceeded by over 10 dB.

Based on the calculated levels and the guidance of BS 4142 and IEMA, the calculated noise levels do not reach the threshold of a negligible impact.

6.4 Consideration of Maximum Noise Levels

Of the considered noise sources in the service yard, the instantaneous noise levels due to a HGV door slam produces the highest at-source $L_{A_{Fmax}}$ level.

The noise model has been interrogated to predict the resulting maximum noise levels at the assessed receivers due to a door slam event.

As this assessment is outside the scope of BS 4142, penalties for tonality, impulsivity and intermittency have not been applied, and time corrections (relative to a 15-minute assessment period) have been removed.

Figure 6.2 shows a plan view of noise propagation from the site, towards the identified receptors, due to an instantaneous event of a HGV door slam occurring simultaneously in each loading area.

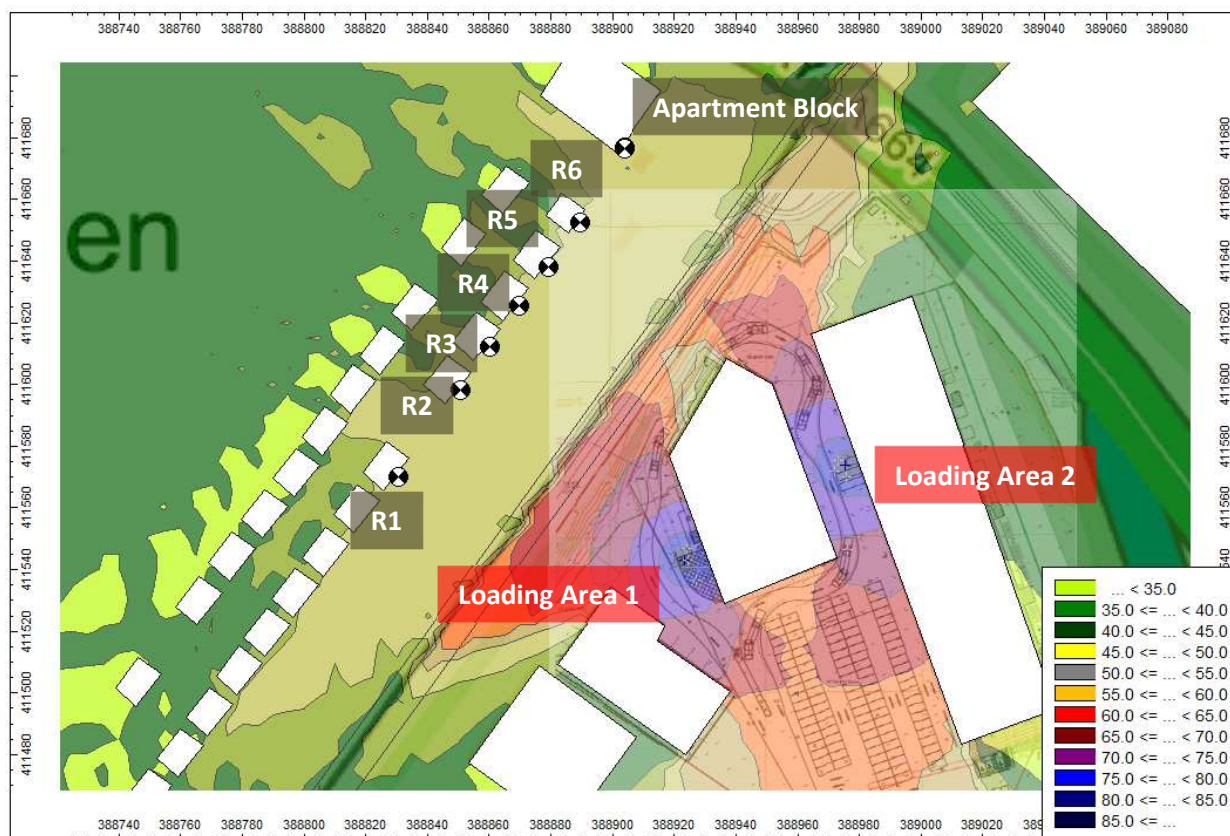


Figure 6.2 Plan view of maximum noise propagation in 3D noise model

Taking into account all necessary acoustic corrections, the resulting maximum noise rating level at the identified residential windows would be as shown in Table 6.4.

Receiver	Calculated Maximum Noise Level at Receiver L_{AFmax}	Recommended Limit L_{AFmax}
R1	46 dB(A)	60 dB(A)
R2	47 dB(A)	
R3	47 dB(A)	
R4	46 dB(A)	
R5	45 dB(A)	
R6	46 dB(A)	
Apartments – 1 st Floor	48 dB(A)	
Apartments – 2 nd Floor	50 dB(A)	
Apartments – 3 rd Floor	54 dB(A)	

Table 6.4 Maximum noise levels at noise sensitive receivers

As shown in Table 6.4, noise emissions from the loudest instantaneous event anticipated from the proposed operations do not reach the recommend limit for maximum noise emission levels.

6.5 Noise Management Plan

In order to ensure the calculated noise levels at nearby receivers are not exceeded, the following actions are recommended to manage noise:

- Staff and delivery vehicle drivers should be made aware of nearby residential spaces and asked to limit excessive noise.
- Where possible delivery vehicles under the control of Hanson Springs Limited should be checked to ensure no loose metal parts are present to minimise unnecessary impulsive noise.
- Any forklifts under the control of Hanson Springs Limited should be fitted with atonal, white noise reversing alarms where practicable^[1].
- Should the number of deliveries collections intensify, a reassessment of noise impact should be undertaken.

[1] The assessment has considered tonal alarms in the calculation of noise emissions levels. This is therefore not an absolute requirement, but a recommendation to further reduce noise emissions where possible.

7.0 CONCLUSION

An environmental noise survey has been undertaken at Hanson Springs, Gorrells Way, Rochdale OL11 2PX. The results of the survey have enabled criteria to be set for noise emissions from proposed loading/unloading operations in accordance with the requirements of BS 4142.

A noise impact assessment has then been undertaken using previously measured noise data to predict the noise levels due to loading and unloading, at the nearby noise sensitive receivers.

Calculations show that noise emissions from the proposed relocation of operations would result in noise level that is classed as a low impact according to the relevant standard, even when considering a worst-case scenario.

Maximum noise levels from the loudest anticipated noise events are not expected to reach the recommended limits stipulated by WHO.



Not to scale

Description:

Indicative site plan showing noise monitoring position and nearest sensitive receiver

Date	04 November 2024
Reference	19265-SP1
Project Name	Hanson Springs, Gorrells Way
Image ©	Google Earth

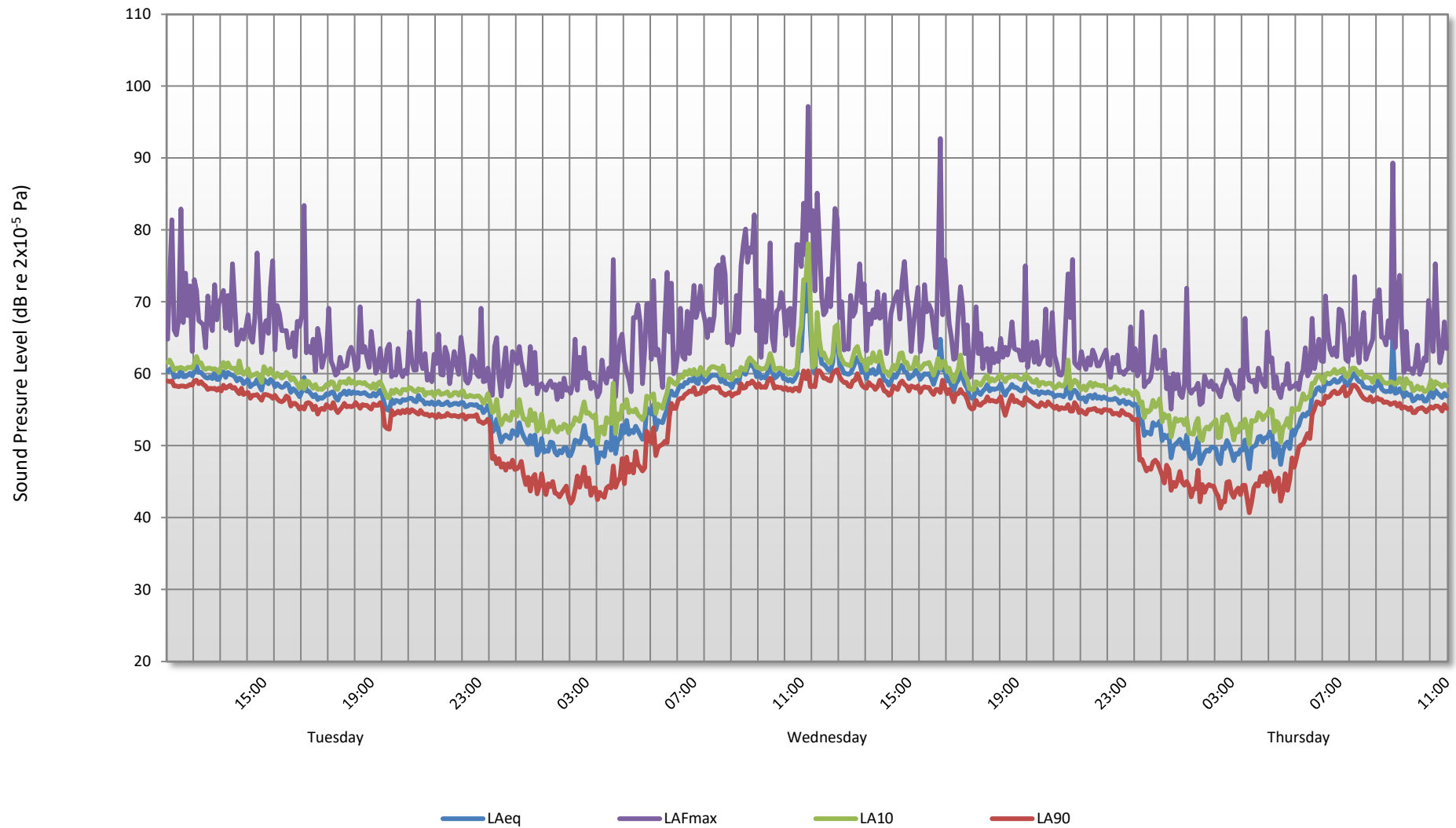
Key:

	Unattended Noise Survey Position
	Noise Sensitive Receiver

Hanson Springs, Gorrells Way, Rochdale

Position 1

Environmental Noise Time History
10 September 2024 to 12 September 2024



GLOSSARY OF ACOUSTIC TERMINOLOGY

dB(A)

The human ear is less sensitive to low (below 125Hz) and high (above 16kHz) frequency sounds. A sound level meter duplicates the ear's variable sensitivity to sound of different frequencies. This is achieved by building a filter into the instrument with a similar frequency response to that of the ear. This is called an A-weighting filter. Measurements of sound made with this filter are called A-weighted sound level measurements and the unit is dB(A).

L_{eq}

The sound from noise sources often fluctuates widely during a given period of time. An average value can be measured, the equivalent sound pressure level L_{eq} . The L_{eq} is the equivalent sound level which would deliver the same sound energy as the actual fluctuating sound measured in the same time period.

L_{10}

This is the level exceeded for not more than 10% of the time. This parameter is often used as a "not to exceed" criterion for noise

L_{90}

This is the level exceeded for not more than 90% of the time. This parameter is often used as a descriptor of "background noise" for environmental impact studies.

L_{max}

This is the maximum sound pressure level that has been measured over a period.

Octave Bands

In order to completely determine the composition of a sound it is necessary to determine the sound level at each frequency individually. Usually, values are stated in octave bands. The audible frequency region is divided into 10 such octave bands whose centre frequencies are defined in accordance with international standards.

Addition of noise from several sources

Noise from different sound sources combines to produce a sound level higher than that from any individual source. Two equally intense sound sources operating together produce a sound level which is 3dB higher than one alone and 10 sources produce a 10 dB higher sound level.

Attenuation by distance

Sound which propagates from a point source in free air attenuates by 6dB for each doubling of distance from the noise source. Sound energy from line sources (e.g. stream of cars) drops off by 3 dB for each doubling of distance.

Subjective impression of noise

Sound intensity is not perceived directly at the ear; rather it is transferred by the complex hearing mechanism to the brain where acoustic sensations can be interpreted as loudness. This makes hearing perception highly individualised. Sensitivity to noise also depends on frequency content, time of occurrence, duration of sound and psychological factors such as emotion and expectations. The following table is a reasonable guide to help explain increases or decreases in sound levels for many acoustic scenarios.

Change in sound level (dB)	Change in perceived loudness
1	Imperceptible
3	Just barely perceptible
6	Clearly noticeable
10	About twice as loud
20	About 4 times as loud

Barriers

Outdoor barriers can be used to reduce environmental noises, such as traffic noise. The effectiveness of barriers is dependent on factors such as its distance from the noise source and the receiver, its height and its construction.

Reverberation control

When sound falls on the surfaces of a room, part of its energy is absorbed and part is reflected back into the room. The amount of reflected sound defines the reverberation of a room, a characteristic that is critical for spaces of different uses as it can affect the quality of audio signals such as speech or music. Excess reverberation in a room can be controlled by the effective use of sound-absorbing treatment on the surfaces, such as fibrous ceiling boards, curtains and carpets.