

London office

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

Manchester office

105 Manchester Road
Bury
BL9 0TD
Tel: 0161 850 2280

113 LAPWING LANE, DIDSBURY, MANCHESTER

NOISE IMPACT ASSESSMENT

Report 16472-NIA-01_RevA

Prepared on 12 July 2021

Issued For:
Neighbourhood Pizza Co t/a GB Pizza Co
113 Lapwing Lane
Didsbury
Manchester
M20 6UR



Executive Summary

This noise impact assessment has been undertaken in order to assess an outdoor dining area for at 113 Lapwing Lane, Didsbury, Manchester.

A background noise survey has been undertaken as detailed in the report, in order to determine an appropriate noise emission criterion, in accordance with the requirements of Manchester City Council

Calculations were undertaken for the nearest identified receiver, identified as a first floor window overlooking the dining area. 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 compliance with the established criterion is feasible, dependant on the following material considerations:

- The dining will be in use between the restaurant opening and 21:00 only
- The dining area and receiver locations are as established in this report and marked on the attached site plan

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 plant 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.

Contents

1.0	INTRODUCTION	1
2.0	SITE DESCRIPTION	1
3.0	ENVIRONMENTAL NOISE SURVEY	2
3.1	Unattended Noise Survey Procedure	2
3.2	Weather Conditions	2
3.3	Equipment	3
4.0	RESULTS.....	3
4.1	Unattended Noise Survey Results	3
5.0	NOISE CRITERIA	4
6.0	PLANT NOISE IMPACT ASSESSMENT	5
6.1	Proposed Activities.....	5
6.2	Noise Impact Assessment.....	6
6.3	Proposed Noise Management Plan	6
7.0	CONCLUSION	7

List of Attachments

16472-SP1	Indicative Site Plan
16472-TH1	Environmental Noise Time History
Appendix A	Glossary of Acoustic Terminology
Appendix B	Acoustic Calculations

Document Revision	Date of Revision	Reasons for Revision	Revision By
0	19/03/2021	First Issue	Jamie Newton AMIOA
RevC	08/07/2021	Reassessment to minimum background noise level	Jamie Newton AMIOA

1.0 INTRODUCTION

Clement Acoustics has been commissioned by GB Pizza Co to measure existing background noise levels at 113 Lapwing Lane, Didsbury, Manchester. Measured noise levels have been used to determine noise emissions criteria for a proposed outdoor dining area in agreement with the planning requirements of Manchester City Council.

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 a ground floor restaurant with two floors of residential premises above, and bound by similar combined commercial and residential premises to the north and south. Lapwing Lane and West Didsbury Metrolink station are located to the west of the site, and further residential premises are located to the east. The surrounding area is mixed commercial and residential in nature.

Current proposals are to develop an outdoor dining area in a yard to the rear of the site. The worst case operating hours of the proposed dining area are understood to be 12:00 to 21:00.

A first floor window overlooking the dining area has been identified as the nearest affected receiver. This nearest noise sensitive receiver was identified through observations on-site. If there are any receivers closer to that 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 the dining area is operating or any noise mitigation measures are implemented.

Locations are shown in attached site plan 16472-SP1.

3.0 ENVIRONMENTAL NOISE SURVEY

3.1 Unattended Noise Survey Procedure

Measurements were undertaken at one position as shown on indicative site drawing 16472-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 surroundings and position used for the monitoring location are described in Table 3.1.

Position No.	Description
1	The microphone was mounted on a 1 st floor flat roof at the back of the building. The microphone was positioned 3 m in front of the nearest receiver window. ^[1]

Table 3.1: Description of unattended monitoring locations

Note [1]: The position was considered to be free-field according to guidance found in BS 4142: 2014, and a correction for reflections has therefore not been applied.

Continuous automated monitoring was undertaken for the duration of the survey between 20:45 on 13 March 2021 and 20:45 on 15 March 2021.

The measurement procedure generally complied with BS 7445: 1991: '*Description and measurement of environmental noise, Part 2- Acquisition of data pertinent to land use*'.

The locations of the measurement positions are shown on attached site plan 16472-SP1.

3.2 Weather Conditions

At the time of set-up and collection of the monitoring equipment the weather conditions were generally dry with light winds.

It is understood that during the survey there were periods of rain on the afternoon of 14 March. Average wind speeds were below 0.7 m/s.

It is considered that the weather conditions did not significantly adversely affect the measurements and are therefore considered 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 957 Class 1 Sound Level Meter
- Norsonic Type 1251 Class 1 Calibrator

4.0 RESULTS

4.1 Unattended Noise Survey Results

The L_{Aeq} : 15min, L_{Amax} : 15min, L_{A10} : 15min and L_{A90} : 5min acoustic parameters were measured at the location shown in site drawing 16472-SP1.

Measured noise levels are shown as a time history in Figure 16472-TH1, with average ambient and minimum background noise levels summarised in Table 4.1.

Time Period	Average ambient noise level L_{eq} : T	Minimum background noise level L_{90} : 15min
Daytime (07:00 - 23:00)	50 dB(A)	37 dB(A)
Night-time (23:00 - 07:00)	44 dB(A)	29 dB(A)
Proposed Operating Hours (12:00 – 21:00)	50 dB(A)	40 dB(A)

Table 4.1: Average ambient and minimum background noise levels

It should be noted that this survey was undertaken during a “lockdown” period of the Covid-19 pandemic, and the measured ambient and background noise levels presented in Table 4.1 may be lower than during a normal period.

5.0 NOISE CRITERIA

In order to provide an assessment comparing anticipated noise emissions with existing levels of background noise, guidance has been taken from British Standard 4142: 2014 '*Methods for rating and assessing industrial and commercial sound*'.

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 BS4142

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 noise level, this is stated as an indication of the sound source having a low impact.

Calculated noise emissions will be assessed against the background noise levels shown in Table 4.1. It should be noted that daytime noise emissions are assessed over a one-hour reference period, while night-time noise emissions are assessed over a 15-minute reference period.

6.0 PLANT NOISE IMPACT ASSESSMENT

6.1 Proposed Activities

The proposed dining area location is on the ground floor at the rear of the building which is shown on indicative site plans 16472-SP1. The dining area contains seating for approximately 12 people, covered with a roof consisting of engineered wood boards either side of timber joists, with four 0.5 m² openable corrugated clear roof lights, two of which open. While the roof lights are open, the roof is expected to provide a sound reduction performance of that shown in Table 6.1.

Element	Sound Reduction Index (dB) in each frequency							
	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
Composite roof (Timber Roof + Roof Light Apertures)	12	11	12	12	12	12	12	12

Table 6.1: SRI of roof

The closest receiver has been identified as the first floor window of a residential property above the site, which is approximately 3 m from the centre of the proposed outdoor dining area. The anticipated noise from the dining area has been modelled as a plane source.

Maximum noise emissions for the dining area are shown in Table 6.2, based on a noise rating criterion of NR 30 at 1m from the receiver window. When taking into account a smaller capacity, these levels are comparable to measurements made in an outdoor dining area of a shisha bar with a capacity of approximately 50 people.

Unit	Sound Pressure Levels (at 1 meter, dB) in each Frequency Band								
	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dB(A)
Maximum allowable noise emissions	80	68	61	55	51	48	46	44	60
Representative levels from larger dining and smoking area	64	59	59	61	57	54	50	44	62

Table 6.2: noise emissions levels

6.2 Noise Impact Assessment

The noise impact has been calculated for a first floor window on the rear façade of the building, shown as Receiver 1 on the attached site plans.

The noise level breakout 1 m from the roof has been calculated using the following formula.

$$L_{outside} = L_{inside} - R_{composite} - 6$$

Formula 6.1

Propagation from the breakout area to the receiver has been calculated using proprietary noise mapping software CadnaA.

Based on the nature of noise emissions, a penalty of +3 dB will be applied, in order to account for the distinctive nature of noise emissions. The nature of noise in the external seating area would not be considered to be tonal, impulsive nor intermittent according to the definitions given in BS 4142: 2014.

With all corrections as specified in British Standard 4142: 2014 applied, the noise rating levels would be as shown in Table 6.3. Detailed calculations are shown in Appendix B.

Calculated Noise Rating Level at Receiver $L_{Ar,Tr}$	Minimum Measured Background Noise [Operating Hours] $L_{A90,15mins}$	Difference	Indication
40 dB(A)	40 dB(A)	0 dB	Indication of the sound source having a low impact

Table 6.3: Noise rating level and assessment for receiver during operating hours

As shown in Table 6.3, noise emissions from the proposed operations at Receiver 1 are expected to be at a level indicative of the sound source having a low impact as specified in the British Standard.

6.3 Proposed Noise Management Plan

In order to minimise the potential for noise transmission from external activities, the following measures are proposed during the operation of the external terrace area:

- Reasonable steps, such as regular patrols, should be taken to monitor and control behaviour to minimise unreasonable noise due to patrons
- Cut-off point of 21:00 to be set, after which the external seating area should be closed, and all external doors and windows closed

[1] This recommended limit is a prediction only. It may be appropriate to undertake a commissioning exercise to determine the level where noise breakout is considered acceptable. The final determined level could be lower than 50 dB(A).

7.0 CONCLUSION

An environmental noise survey has been undertaken at 113 Lapwing Lane, Didsbury, Manchester. The results of the survey have enabled criteria to be set for noise emissions from the proposed dining area in accordance with the requirements of Manchester City Council.

A noise impact assessment has then been undertaken using manufacturer noise data to predict the noise levels, due to the proposed plant, at the nearby noise sensitive receivers.

Calculations show that maximum allowable noise emissions from the proposed dining area are comparable to those of a larger dining and shisha bar. If these noise emissions are adhered to, it is indicated that the dining area would have a low impact on the nearby residential receivers.

Author **Jamie Newton**
Consultant
BEng (Hons) AMIOA



12 July 2021

Reviewed **Andrew Thomas**
Senior Consultant
BSc (Hons) MIOA

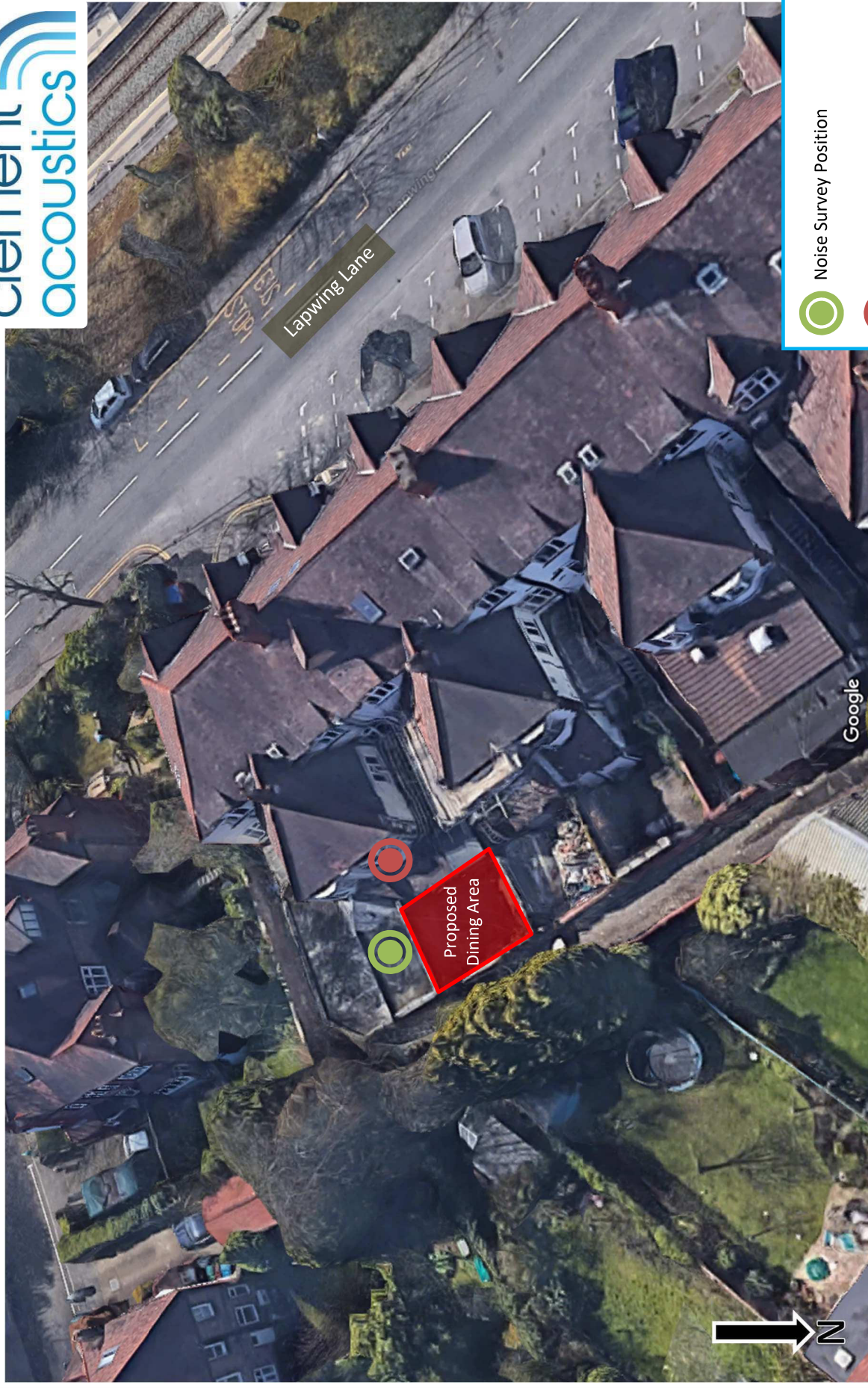


12 July 2021

Approved **Duncan Martin**
Director
BSc (Hons) MIOA



12 July 2021



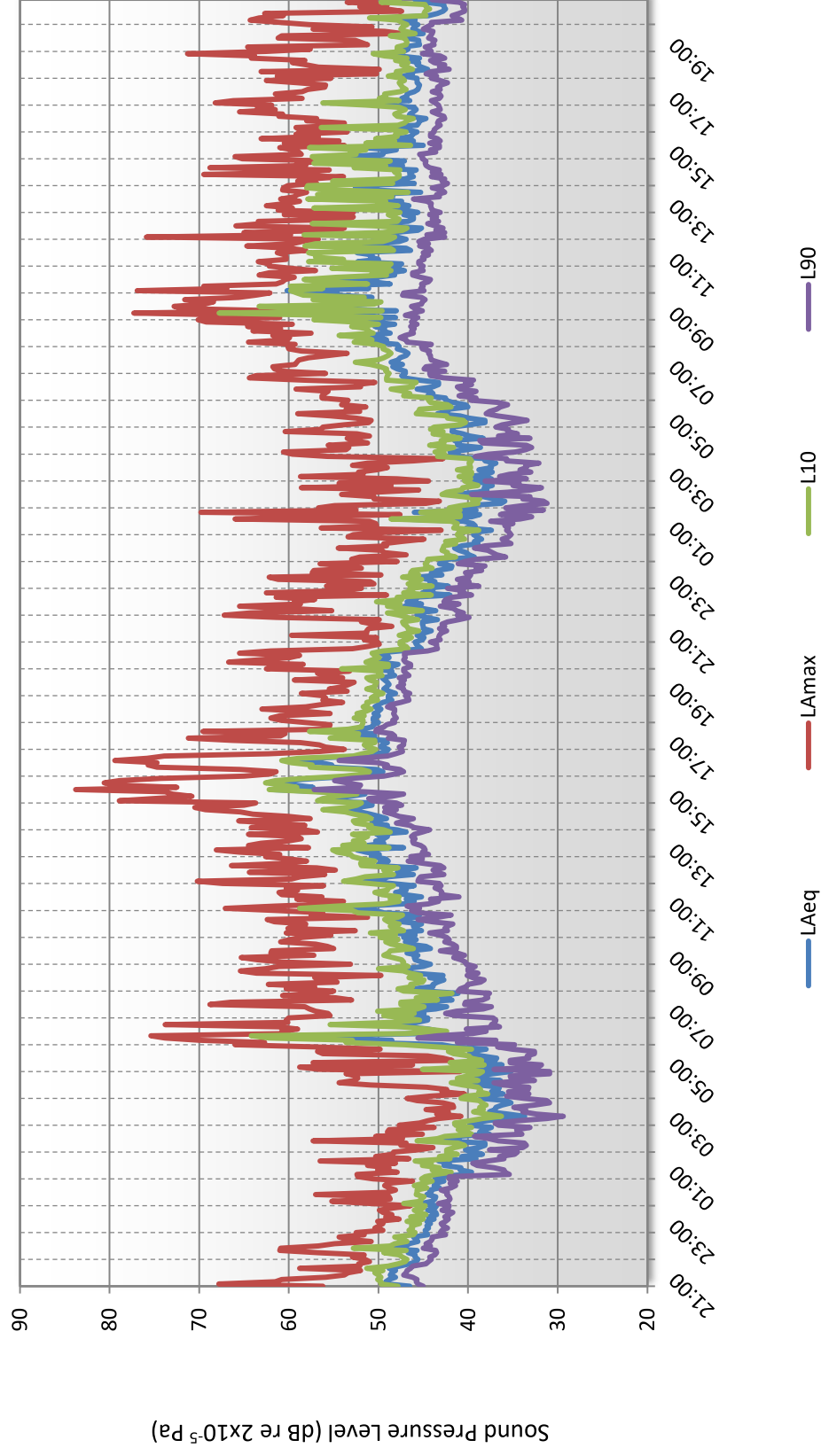
Noise Survey Position

Noise Sensitive Receiver

113 Lapwing Lane, Didsbury, Manchester

Environmental Noise Time History

13/03/2021 to 15/03/2021



16472-TH1

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 3dB 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.

APPENDIX B

16427

113 Lapwing Lane, Didsbury, Manchester

EXTERNAL DINING NOISE EMISSIONS CALCULATION

$$L_{outside} = L_{inside} - R_{composite} - 6$$

Receiver: Nearest Residential Receiver

Source: Outdoor Seating Area

	Frequency, Hz								
	63	125	250	500	1k	2k	4k	8k	dB(A)
Predicted sound pressure level within seating area									
Level Inside - Typical Restaurant Noise, dB	80	68	61	55	51	48	46	44	60
R Composite	12	11	12	12	12	12	12	12	
L Outside - 1m from roof	62	51	43	37	33	30	28	26	42

Propagation Calculation

	Frequency, Hz								
	63	125	250	500	1k	2k	4k	8k	dB(A)
L Outside - 1m from roof	62	51	43	37	33	30	28	26	42
Propagation correction (Derived from CadnaA model)	-5	-5	-5	-5	-5	-5	-5	-5	
Specific Sound Level at Receiver	57	46	38	32	28	25	23	21	37
Correction for Distinctivity	3	3	3	3	3	3	3	3	
Rating Level at Receiver	60	49	41	35	31	28	26	24	40

Design Criterion 40

BS 8233 ASSESSMENT CALCULATION

Receiver: Inside Nearest Residential Window

Source: Proposed plant installation

	Frequency, Hz								
	63	125	250	500	1k	2k	4k	8k	dB(A)
Sound pressure level outside window	60	49	41	35	31	28	26	24	40
Minimum attenuation from partially open window, dB	-15	-15	-15	-15	-15	-15	-15	-15	
Sound pressure level inside nearest noise sensitive premises	45	34	26	20	16	13	11	9	25

Design Criterion 30