‖ January 2018 ‖ Version 1.2 ‖

Noise Management Strategy

Hale Country Club
Clay Lane
Hale
Timperley
Altringham
WA15 7AF

Joynes Nash

Acoustics · Environmental · Public Health

Client	The Hut Group
Date:	11th January 2018
Author:	Peter Nash
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About the Author

Pete Nash BSc (Hons), MSc, CEnvH, MCIEH, MIOA

Peter Nash has 16 years' experience as a Local Authority Environmental Health Officer, up to Technical Manager Level and has 9 years of Professional Practice within the Environment Industry. He holds a BSc(Hons) in Environmental Health, the IOA Diploma in Acoustics and Noise Control and an MSc in Applied Acoustics. He is a Chartered Environmental Health Practitioner and registered with the Environmental Health Registration Board. Peter is a Member of the Chartered Institute of Environmental Health, and a Member of the Institute of Acoustics. He has appeared as an expert witness in a number of significant noise nuisance and planning cases, public enquiries and appeals.

Contents

1. Introduction

Joynes Nash Ltd has been commissioned by The Hut Group to undertake appropriate technical assessments and prepare a noise management strategy to support a premises license application for events to be held within a marquee in the grounds of Hale Country Club.

A licence application has been made, to which the Environmental Health Department of Trafford Council, have raised an objection to the application on noise grounds, no other objections have been received from local residents or the other Responsible Authorities. This strategy is intended to address the concerns raised and seek a positive outcome from any further licensing process.

2. Purpose of the Noise Management Strategy

This document is intended to provide an assessment of the potential noise impact of events with amplified music within any marquee, on existing nearby noise sensitive properties.

The scope of this report is as follows: -

i. To provide details of a background noise survey undertaken at the premises.
ii. To provide details of noise propagation tests including noise measurements and subjective assessment of music noise levels emitted from the proposed external entertainment area at the nearest noise sensitive properties.
iii. To provide an assessment of the potential noise impact on noise sensitive properties.
iv. Provide guidance on noise limits for the venue

It is intended that the attached Noise Management Plan (in Appendix A) be considered as a 'live' document which will evolve further as a result of on-going liaison with the client, the local authority and local residents. Likewise, it is expected to evolve as final preparations are made to bring the venue into operation for external events, the operational requirements become clearer and the relevant technical considerations become known for those events.

3. Consultants Experience

Joynes Nash is a leading consultancy for the live events industry. We have extensive experience of live music events and a proven track record of working with event organisers to enhance the audience's experience, whilst preserving the image of venues for future years.

Our consultants experience has ranged from relatively small scale to major events staged both in urban and residential environments, providing for tens of thousands of people. Projects and clients have included Secret Cinema, Made in Birmingham, Carfest, Garage Nation and Red Bull Secret Underground Projects. We are also proud to be long standing suppliers to the likes of Donington Park Racing, Yorkshire County Cricket Club, Saracens Rugby Club and many other companies where we support and develop their interests with respect to live music venues. We also work on behalf of many Local Authorities in overseeing events or managing such on their behalf, including Waltham Forest and London Borough of Lambeth.

We consider despite the many technical challenges that events bring, that relationships between all interested parties are of paramount importance and that each and every one of these understands their responsibilities. We therefore approach each venue not in isolation, but carefully consider the public image of such and the thoughts of the wider community.

4. The Site and its Environment

Hale Country Club and Spa is located within the village of Timperley, to the south west of the Manchester Conurbation and contains a gym, swimming pool, treatment areas and restaurants.

The area surrounding the site is a mix of residential and open land and uses. The area has relatively high background noise levels from nearby major roads and the airport to the south east. The club owners wish to utilise the football pitch to the south of the club building to host occasional licensed events within a marquee. This area is away from the majority of the surrounding noise sensitive premises, with the majority of the nearby houses being to the north of the club, so benefiting from significant barrier effect from the club itself.

Plan 1: Location of club and surrounding area.

The aim would be to utilise this area for relatively low-key events such as staff parties, corporate promotional events etc, within a defined marquee. The aim is for a maximum of 10 events a year, with 6 being from the hours of 10:00 – 00:00 and four from 10:00 – 19:00.

This is something that they have successfully done previously outside of the licensing regime, where on the 26th June 2017 an event for 1000 people was staged until 01:30 without any issue being raised by neighbours or regulatory authorities. It is proposed that events will operate until midnight at the latest, albeit not necessarily for all events.

5. Entertainment Noise Criteria

Guidance for this type of venue may be taken from various documents as follows.

Noise Council Code of Practice (Pop Code)

The Code of Practice for the Control of Environmental Noise from Concerts is the established guidance with respect to music events. Since its publication in 1995, there have been several recommended modifications to the Code and as a result, the Code of Practice is currently under review, in particular with respect to the number of events and corresponding levels. The use of the code now comes with a caution from the CIEH that it does not reflect the relaxations brought in by the Licensing Act 2003, and therefore its use must be treated with caution (in effect that it may be over protective)

The recommended noise limits for the venue contained within the Code for events held between the hours of 09.00 and 23.00hrs:

Concert Days Per Calendar Year, per venue	Venue Category	Guideline
1-3	Urban and Rural Venues	The Music Noise Level should not exceed 65dB(A) over a 15-minute period.
4-12	All Venues	The Music Noise Level should not exceed the background noise level by more than 15dB(A) over a 15-minute period.

For indoor venues, operating up to 12 days a year, the Code recommends that the music noise level, should not exceed the background level by more than 15dB(A), for events finishing by 23:00.

The Code suggests that for events continuing or held between the hours 23:00 and 09:00, the music noise should not be inaudible within noise-sensitive premises with windows open in a typical manner for ventilation. The Code of Practice also advises that providing music noise is controlled so that it is barely audible externally, it will generally be inaudible within bedrooms with windows open.

In order to provide objective guidance, for events continuing after 23:00hrs, a music noise level of 45dB $L_{Aeq,5min}$ is adopted at many venues in the United Kingdom. In these cases, it is considered

that a partially open window will provide 15dB attenuation, therefore achieving the guidance for a 'good' standard as specified in British Standard BS8233:2014.

At this time, it is unknown how many events are likely to take place within the marquee, but it is likely to be no more than 10 event days per year, although not every event will have amplified music as the primary source of entertainment and a number of events will finish earlier than 00:00hrs.

The Licensing Act 2003

The Act introduced a single integrated system for regulating the sale by retail of alcohol, the supply of alcohol in a club, the provision of regulated entertainment and late night refreshment. The provision of regulated entertainment to the public is relevant in terms of noise and in doing so those responsible must carry out their function without causing a Public Nuisance.

In discharging its functions Local Authorities may place conditions on Licences, providing they are necessary and appropriate. The guidance is clear in its advice that it is essential to maintain a balance between the licence holder and the viability of the event and the needs of the local community. It is generally accepted that properties in the vicinity of large scale events will be able to hear sound from time to time. Typically, we see conditions requiring the provision of a noise management strategy, with regular reviews as an appropriate way of controlling noise emissions.

The courts have been clear in the case law around the Licensing Act 2003, that public nuisance in terms of the licensing objectives, is the common law definition of public nuisance.

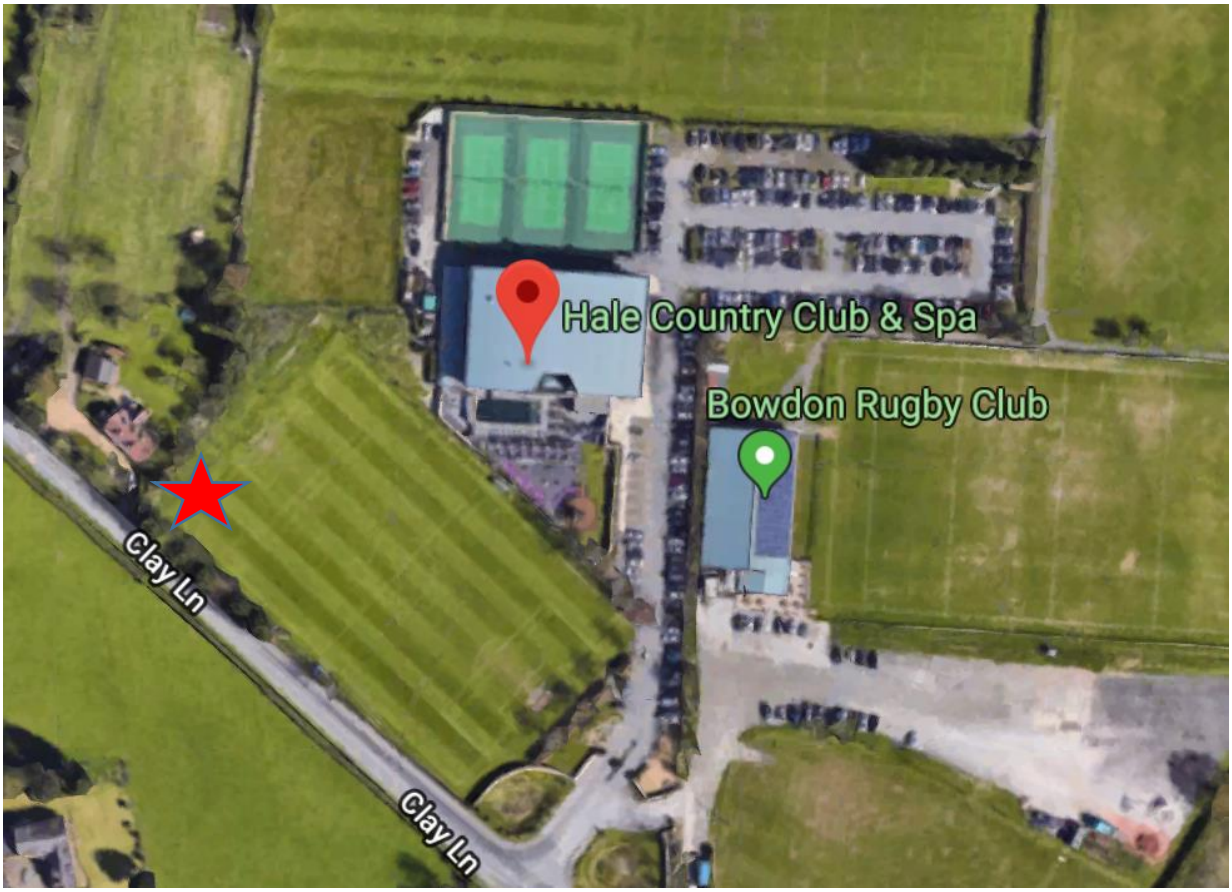
British Standard 8233: Guidance on Sound Insulation and Noise Reduction for Buildings

The British Standard BS8233:2014 recommends design criteria for internal noise levels within residential properties. This standard suggests criteria, such as reasonable resting / sleeping conditions and proposes noise limits that will normally satisfy these criteria for most people.
With respect to bedrooms, i.e. night-time, the standard provides limits for 'good' and 'reasonable' noise levels. A level of 30dBLAeq, T equates to a 'good' condition and 35dBLAeq, T equates to a 'reasonable' condition. A summary of the noise guidelines for reasonable resting / sleeping conditions in living rooms and bedrooms is shown in the Table below:

Criterion	Typical situations	Design range LAeq,T dB	
		Good	Reasonable
Reasonable resting/sleeping conditions	Bedrooms	30	35
	Living Rooms	35	40

6. Background Noise Survey

A background noise assessment was undertaken on the evening of the 17th November 2017, from 19:00 – 00:00. The weather was ideal for ambient noise monitoring with temperatures of 5 degrees C, wind speeds below 2 m/s and no precipitation. The monitoring location was on the edge of the football pitch adjacent to the nearest residential receptor on Clay Lane.



Plan 2: Background noise monitoring location

The equipment used was:

Sound Level Meter:	NTI XL2-TA
Serial No:	A2A-09596-TA
Calibrated:	2nd March 2016
Field Calibrator:	Bruel & Kjaer 4231
Serial Number:	2466104
Calibrated:	21st April 2017

The meter was set to one second logging, the full data set is presented within Appendix B, but the measurement data is summarised in the table below:

Time	$L_{Aeq\ (1\ hour)}$ (dB)	$L_{A90\ (1\ hour)}$ (dB)	L_{AFmax} (dB)
19:00 – 20:00	58.8	47.4	77.6
20:00 – 21:00	58.5	47.2	77.3
21:00 – 22:00	56.6	45.8	78
22:00 – 23:00	55.4	45.9	76.1
23:00 – 00:00	57.8	45.9	87.3

In accordance with the methodology set out within the Code of Practice for Concerts, the background noise level up until 23.00hrs has been determined to be 47dB. For the period 23.00 to 00.00hrs the background level was determined to be 46dB.

The consistency of the results for both the L_{Aeq} and the L_{AF90} are an indication of how stable the noise climate is in this location. It is completely dominated by road traffic noise and does not show a noticeable decline throughout the evening.

7. Noise Propagation Test

On the evening of the 29th November 2017 a noise propagation test was undertaken using a 'sound ceiling' set up in the north-east corner of the football pitch in the approximate location of the proposed marquee. The ceiling was set up on a stand and did not benefit from the small (but noticeable) level of mitigation which any marquee structure would be likely to provide.

Picture 1: Sound Ceiling set up for test

Picture 2: Speaker set up within the sound ceiling

The noise monitoring equipment used for the propagation test was:

Sound Level Meter:	Bruel & Kjaer 2250 G4
Serial No:	3003421
Calibrated:	10th May 2017
Sound Level Meter:	NTI XL2-TA

Serial No:	A2A-09596-TA
Calibrated:	9th May 2016
Field Calibrator:	Bruel & Kjaer 4231
Serial Number:	2466104
Calibrated:	21st April 2017
Field Calibrator:	Bruel & Kjaer 4231
Serial Number:	3011759
Calibrated:	28th March 2017

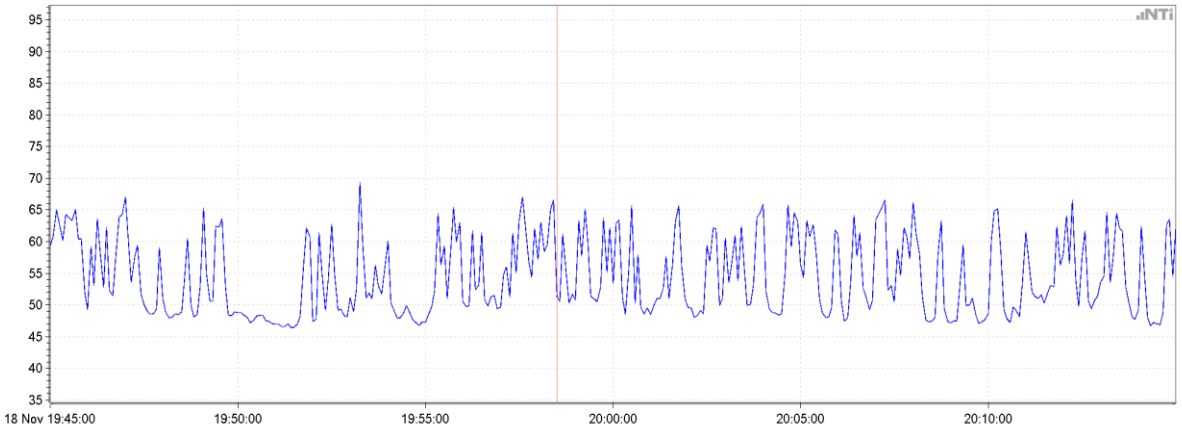
A sound level meter was used to monitor the levels on the 'dance floor' beneath the sound ceiling, and the further meter set up in the same position as that used during the background monitoring.

The data was again logged every second and audio sound recording was undertaken by the sound level meters. The test ran over a 30 minute period from 19:45 – 20:15, the full data set is presented within Appendix B, but is summarised in the table below:

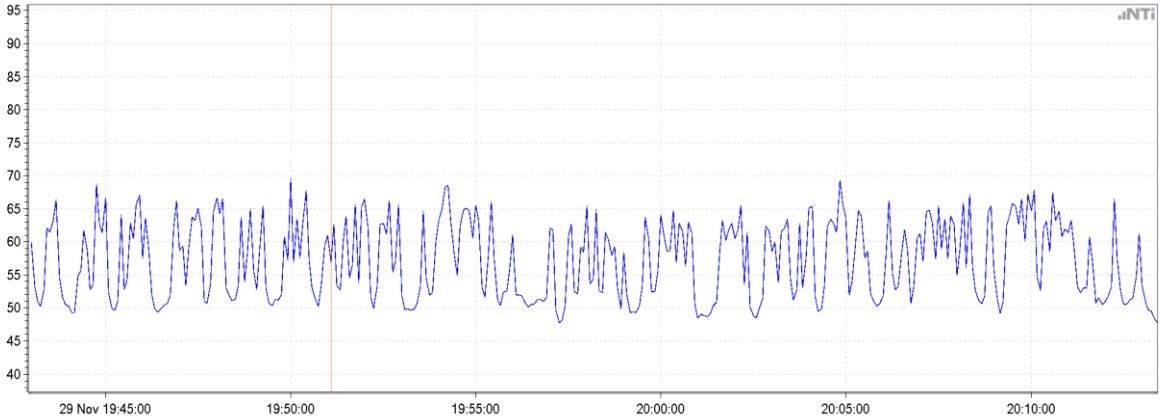
Location	$L_{Aeq\ (30\ min)}$ (dB)	$L_{A90\ (30\ min)}$ (dB)	L_{AFmax} (dB)
'Dance Floor'	93.6	88.2	105.5
Receptor Position	60.8	50.1	76.9

8. Assessment

On initial review of the data it appears that the influence of the music on the existing noise climate is a raising of the L_{Aeq} by approximately 4 dB and the L_{A90} by 3dB. However, when the results are analysed in depth it becomes clear that the noise climate is still completely dominated by road traffic. This can be shown when the graphed data from the tests are shown together.



Graph 1 - Background Survey Graph

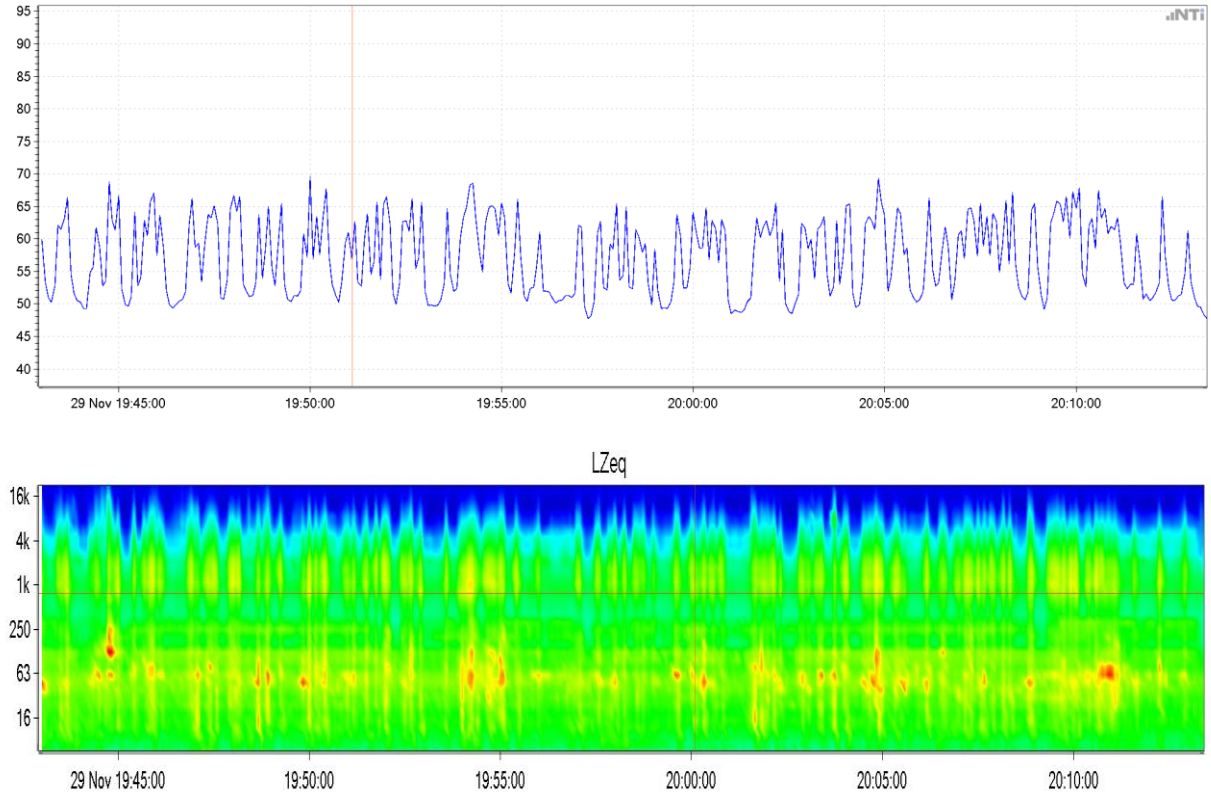


Graph 2 - Music Test Graph

Concern was raised in the objection from the Environmental Health Department about the potential impact of low frequency noise on nearby residents. When the low frequency component of the spectrum is assessed the data shows:

Time	40Hz L_{Zeq} (dB)	50Hz L_{Zeq} (dB)	63Hz L_{Zeq} (dB)	80Hz L_{Zeq} (dB)	100Hz L_{Zeq} (dB)	125Hz L_{Zeq} (dB)
Background 19:45 -20:15	57.3	58.9	58.4	54.8	50.6	50.0
Background 23:00 – 00:00	52.9	62.2	58.2	57.2	56.3	50.6
Test 19:45 – 20:15	56.0	59.6	60.4	56.6	55.2	58.4

When the spectrograph of the test run is compared to the logged sound level it shows that the low frequency sound is all originating from passing vehicles, rather than the music component.



The test exercise was undertaken by two former Local Authority Environmental Health Officers with more than 40 years of Local Authority experience between them. Both consultants were of the opinion that the music noise arising from the sound ceiling whilst very faintly audible during breaks in traffic, would be completely inaudible internally at the nearby residential premises, with windows open for ventilation.

The Code is designed to provide guidance for noise which balances the potential disturbance in the local community against the enjoyable experience of the audience. Our client makes a commitment to gain a greater understanding and seek professional assistance where necessary during the initial phases of operation of the venue for the external events as proposed.

9. Assessment Conclusion

Based on the current national guidance for events, as the premises is looking to hold around 6 events a year, then they would fall into the 4-12 events element of the guidance. This gives them a limit of 15dB above the background noise level, at nearby noise sensitive premises. As the background noise level has been established at 47dB, then the permitted music noise level given in the code of practice

would be 62dB $L_{Aeq\ (15\ min)}$. This would be sufficient to hold live and recorded music with standard PA equipment.

With respect to the period 23:00hrs to 00:00hrs the requirement is to be inaudible within any noise sensitive premises. The sound test has shown that even without the small, but noticeable additional attenuation that would be provided by the marquee, that this requirement can easily be met.

10. Specific Noise Management Plan

A specific noise management plan has been developed in order to control noise from the use of the external marquee at Hale Country Club. This is presented in Appendix A and careful consideration should be given to implementing and exercising the noise control programme before and during events to control both entertainment and ancillary noise from the venue. The noise management plan is a working document and should be reviewed and updated as required.

11. Enquiry Management

Whist the strategies shown in this document are aimed at minimising impact, venues of this nature which hold events are from time to time expected to receive enquiries. The key source of concern amongst residents is typically who to contact, the various roles and responsibilities and the response time to complaints.

Addressing this issue of complaints is important in that not only does it allow any incidences to be dealt with in a timely manner during the event, it also allows due diligence checks to completed and lessons to be learnt in real time. Ultimately it allows residents to feel engaged in the operation of the premises, which assists in gaining greater acceptance.

It is therefore proposed that a phone number and email address will be made available for the venue. Information and comments received will be logged on a database.

12. Noise Monitoring Procedure

Throughout the use of the venue, routine subjective monitoring will be conducted by those responsible (or competent persons acting on their behalf) to ensure that no Public Nuisance exists.

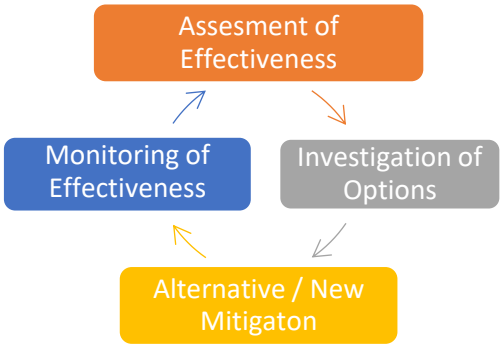
Where deemed necessary by the site management, due to the nature of the event or in response to complaints, those responsible will engage the services of acoustic consultants who will remain responsible for proactively monitoring noise. This will be done through conducting measurements at predetermined locations both internally and externally.

All measurements or observations will be recorded and be available for inspection by the local Authority.

13. Strategy Review Procedure

In order to ensure that the specific noise management plan continues to fulfil its aims and objectives it is of paramount importance that it is reviewed and updated regularly, to reflect changes in the operation of the venue or in response to any lessons learned.

In its simplest sense this will be a continual exercise after each event, where a debrief will take place with those responsible or in response to any enquiries. Any review will incorporate a "corrective action loop" framework to ensure that the noise management strategies as set out in this document are reviewed and amended as required.



For the initial use of the external area an increased level of monitoring will be expected to allow a greater understanding of any impact arising from the provision of external events at the venue and to ensure that the strategies put into place are effective.

A review will be conducted at least annually for the provision of external events at the venue. This will include an assessment of compliance of noise and time limits, review of complaints data and any community or regulatory feedback.

14. Conclusion

Joynes Nash were appointed to an acoustic assessment and noise strategy for events with amplified music within a marquee at Hale Country Club. The assessment shows that it is fully possible to operate the marquee in line with the existing (and very restrictive) guidance, and not cause an undue disturbance to neighbouring premises.

This is further evidenced by the fact that the marquee has already been used for late night events outside of the licensing requirements, with no specialist advice and using a standard PA setup. There were no complaints arising from this event.

Given the above, if good management practices are followed, then it is quite possible to operate the marquee with live and recorded music and not cause undue disturbance to residents, let alone a public or statutory nuisance. As such there is no reason under the prevention of public nuisance licensing objective for the licence to not be granted as applied for.

Appendix A – Specific Noise Management Plan

Hale Country Club- External Marquee

Specific Noise Management Plan

V1.1 January 2018

Review Date January 2019

Each event proposed within the marquee at Hale Country Club will be assessed on a case by case basis and will be subject to keeping noise within acceptable parameters. Each type of event and the risks posed will be dependent on the start and finish times as well as the level and type of entertainment provided but at all times the following good practice measures should be followed:

Sound Amplification Equipment

Audio hire companies providing audio equipment for any event shall observe the following:

a) Any sound amplification equipment used at any times will be installed in such a way as to minimise the noise impact on residential premises or sensitive receptors.
b) The sound amplification equipment will be maintained in a proper and efficient condition so as to minimise the noise impact on residential premises or sensitive receptors.
c) The sound amplification equipment will be operated in such a proper and efficient manner so as to minimise the noise impact on residential or sensitive receptors.

Staff Training

Staff, specifically those at events in charge of sound equipment shall be fully briefed in the contents of the NMP and the need to ensure that noise is kept within acceptable parameters.

Complaints Management

A telephone complaints line will be available for the duration of the event. Should any noise complaints be received, a responsible and competent person will investigate the complaint and if noise levels are deemed unacceptable, immediate action will be taken to reduce the levels of the noise source.

A complaints log will be maintained throughout the event, detailing addresses of complaints, times and actions.

Spread of Events Throughout the Year

All stakeholders for the venue will seek to co-ordinate events in as practical manner as possible to minimise noise and disturbance.

Temporary Fixed Plant Noise

Temporary operation of plant and machinery (such as generators, etc.) may result in noise being generated that is not usually present. To control the impact of this noise which is generally reasonably constant in nature through the event period, those responsible should ensure that it is not audible at the nearest noise sensitive premises. Any equipment which fails or is likely to fail these criteria shall only be used once approved by the venue management or appointed noise consultant.

People / Crowd Noise

Whilst there is no formal mechanism for evaluating or controlling crowd noise, consideration should be given to minimising such as critical points such as arrival and dispersal at the event. This could be through appropriate mechanisms to stagger arrival and departure, temporary screening, marshalling and signage etc.

Where the nature of the function, the number of people attending and the opening and closing time of the function make it appropriate, marshals will marshal and monitor the entrance and egress from the premises including the behaviour of those within the vicinity of the premises. This will help achieve orderly arrival and departure of persons and will reduce the risk of nuisance occurring.

Where the nature of a function and the number of people attending a function make it appropriate, marshals will monitor the behaviour of people on the premises.

Car/Coach Parking

The venue has limited parking and therefore where necessary and where car park marshalling is not provided, methods should be employed (information with tickets etc) to educate those attending events on appropriate parking areas away from residential areas to prevent those returning to vehicles from causing unnecessary disturbance.

Minicabs and Taxis

Preferred minicab companies shall be made available and publicised to encourage people to leave the premises promptly. Such companies should be informed of appropriate set down and pick up points and appropriate marshalling provided during events to ensure that such does not have a detrimental impact on local residents. All such facilities should be within the site or away from residential properties to discourage people from the public highway.

Public Announcement Systems

PA systems can be very disturbing for residents and their use should be kept to a minimum and ideally only in emergency situations. Testing of any emergency systems should also be restricted to sociable hours (e.g 10.00 to 18.00hrs)

Rigging, Set Building and Striking Out

Noise from such activities can be akin to construction site noise and where it is audible at the site boundary, all reasonable measures shall be taken to minimise such.

Deliveries and other Vehicle Movements

Noise from vehicles can be a constant source of noise both on the site and in the surrounding neighbourhood. Careful consideration should be given to vehicle routing, times of operation and deliveries and the need for vehicles to use reversing alarms or refrigerated plant etc.

Bottles used in the premises will not be disposed of late at night or early in the morning, as such disposal can produce high noise levels and be a source of public nuisance.

Noise Conditions, Monitoring and Enforcement

Compliance will be achieved with the target noise limits at all times and the requirement to do so will be specified in the contract conditions with any hirers of the premises. Where appropriate during events, sample noise measurements or subjective measurements will be conducted and recorded by a designated person(s). Immediate action will be taken to reduce levels should this arise.

During all events subjective measurements / monitoring will be carried out at appropriate times along the nearest sensitive facades or boundary of the venue (whichever is appropriate). This is to provide a subjective check that all measures are in place in respect of the premises are working to prevent public nuisance being caused in connection with the operation of premises. Appropriate forms are attached.

Daily Noise Observation Reporting

Date:	
Name of Event:	
Event Duration:	
Event Description:	

Details of Observations Undertaken

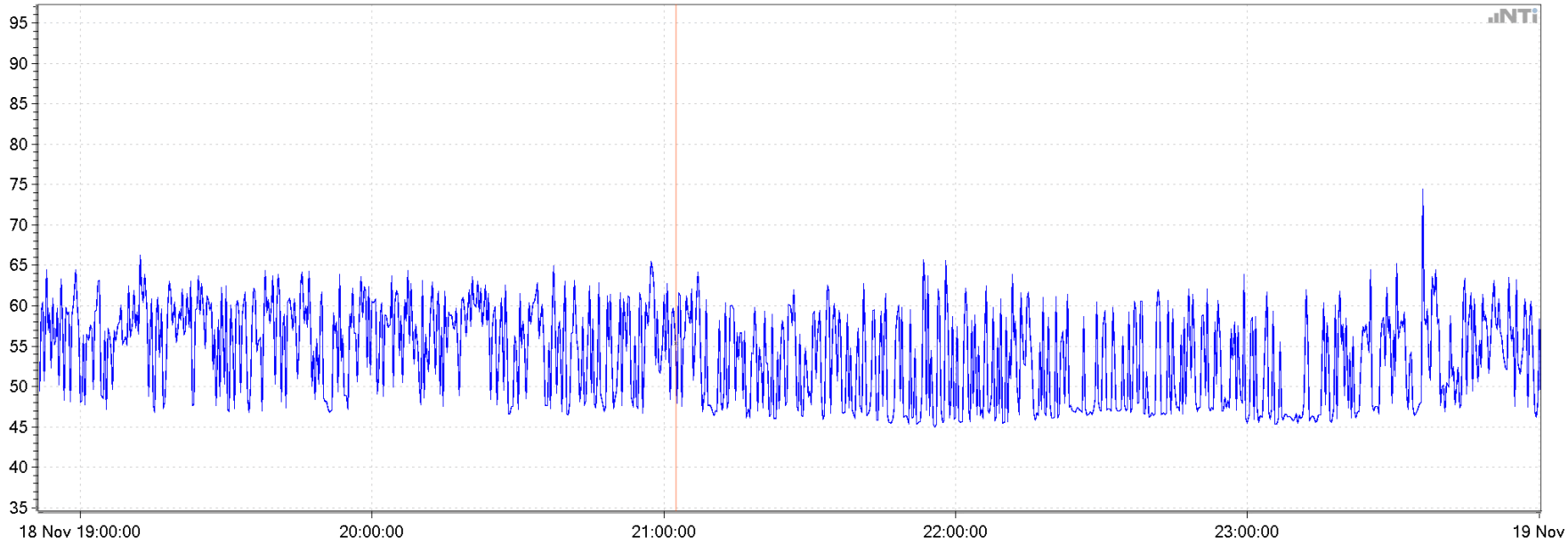
MONITORING LOCATION	TIME	SUBJECTIVE ASSESMENT / MEASURMENTS	REMEDIAL ACTIONS REQUIRED / TAKEN
Example – New Street, Eccles	*00.10 – 00.15*	*Noise from event largely inaudible within external to No.11. Very occasional and low bass beat detectable between lulls in traffic noise, not detectable in vehicle and unlikely to be audible within residential units.*	*No action taken / action taken to reduce low frequency to miminise any potential impact as levels at source can accommodate such reductions.*

Complaints Received

COMPLAINT ADDRESS	TIME	NATURE OF COMPLAINT	SUBJECTIVE ASSESMENT / MEASURMENT	TIME OF VISIT	REMEDIAL ACTIONS REQUIRED / TAKEN
Example – New Street, Eccles	*00.10 – 00.15*	*What are they hearing, when and how effecting property? Is this regular and how long been happening*			*No action taken / action taken to reduce low frequency to minimise any potential impact as levels at source can accommodate such reductions.*

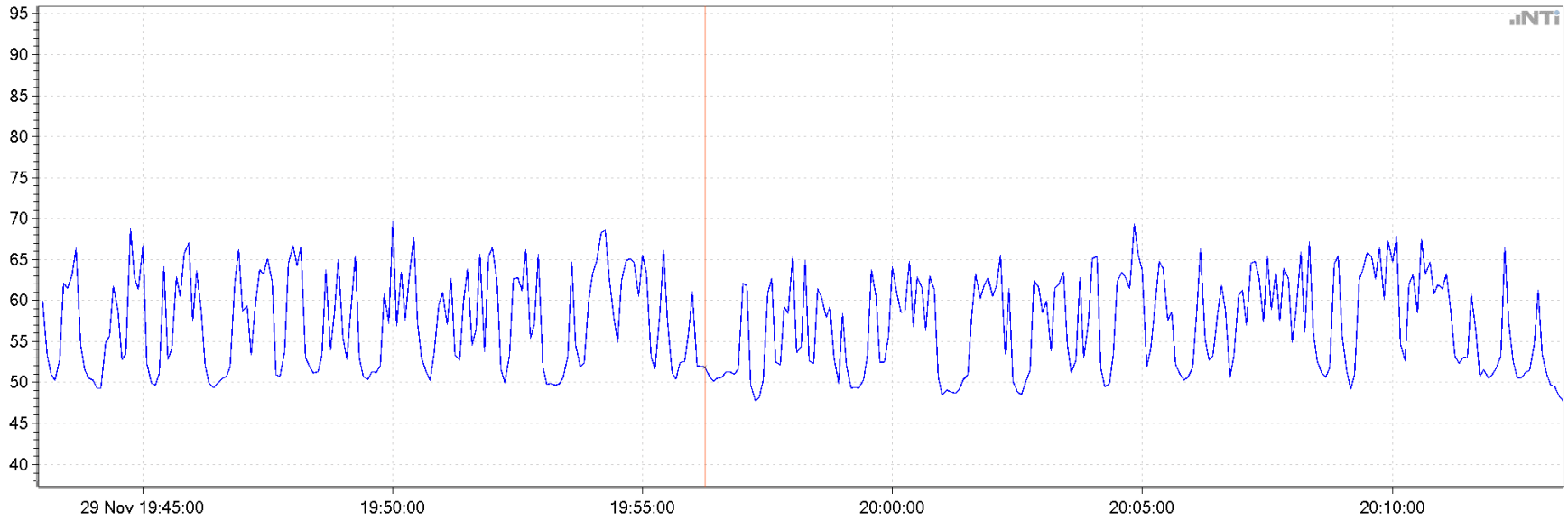
Appendix B – Monitoring Data

18th November 2017

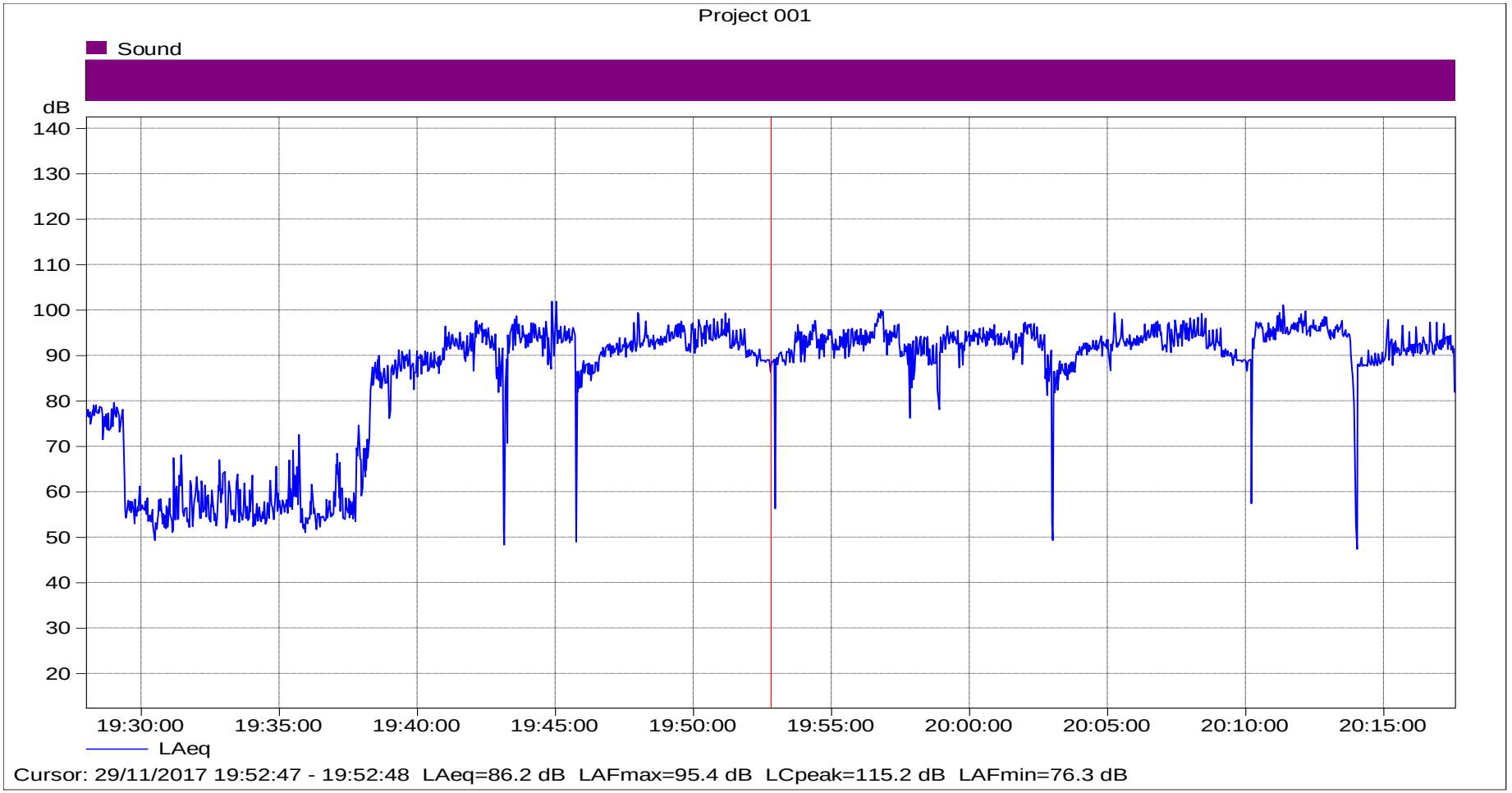


Start Date and Time	Duration	LAeq	LAFmax
18/11/2017 18:50	0:03:26	59.1	72.3
18/11/2017 18:55	0:05:00	59.3	72.9
18/11/2017 19:00	0:05:00	57.8	74.5
18/11/2017 19:05	0:05:00	57.1	69.8
18/11/2017 19:10	0:05:00	60.4	77.6
18/11/2017 19:15	0:05:00	58.5	71.6
18/11/2017 19:20	0:05:00	60	73.2
18/11/2017 19:25	0:05:00	58.6	73.4
18/11/2017 19:30	0:05:00	57.3	69.6
18/11/2017 19:35	0:05:00	59.8	72
18/11/2017 19:40	0:05:00	59	72.6
18/11/2017 19:45	0:05:00	59.5	71.7
18/11/2017 19:50	0:05:00	55.7	75.4
18/11/2017 19:55	0:05:00	59.7	71.8
18/11/2017 20:00	0:05:00	59.1	71.4
18/11/2017 20:05	0:05:00	58.7	71.5
18/11/2017 20:10	0:05:00	58.7	71.8
18/11/2017 20:15	0:05:00	58.7	71.7
18/11/2017 20:20	0:05:00	60.3	73.4
18/11/2017 20:25	0:05:00	56.3	71.6
18/11/2017 20:30	0:05:00	59.2	72.6
18/11/2017 20:35	0:05:00	58.1	75.2
18/11/2017 20:40	0:05:00	56.6	71.9
18/11/2017 20:45	0:05:00	56.4	71.3
18/11/2017 20:50	0:05:00	57.7	73.1
18/11/2017 20:55	0:05:00	60.1	77.3
18/11/2017 21:00	0:05:00	58.4	73.2
18/11/2017 21:05	0:05:00	57.9	71.6
18/11/2017 21:10	0:05:00	55.8	70.9
18/11/2017 21:15	0:05:00	54.5	70.6
18/11/2017 21:20	0:05:00	54.4	71.1
18/11/2017 21:25	0:05:00	56.1	71.3
18/11/2017 21:30	0:05:00	57.7	73.5
18/11/2017 21:35	0:05:00	54.4	68.8
18/11/2017 21:40	0:05:00	55.9	70
18/11/2017 21:45	0:05:00	55.8	70.7
18/11/2017 21:50	0:05:00	58.2	76.5
18/11/2017 21:55	0:05:00	57.4	78
18/11/2017 22:00	0:05:00	55.7	72
18/11/2017 22:05	0:05:00	55.5	72.8
18/11/2017 22:10	0:05:00	58.2	73
18/11/2017 22:15	0:05:00	53.7	70.3
18/11/2017 22:20	0:05:00	54.6	73.1
18/11/2017 22:25	0:05:00	52.2	68.9
18/11/2017 22:30	0:05:00	53.9	70.6
18/11/2017 22:35	0:05:00	55.8	71

18/11/2017 22:40	0:05:00	56.1	71.8
18/11/2017 22:45	0:05:00	55.7	69.7
18/11/2017 22:50	0:05:00	55.9	71
18/11/2017 22:55	0:05:00	55.3	76.1
18/11/2017 23:00	0:05:00	55	70.5
18/11/2017 23:05	0:05:00	50.6	70.6
18/11/2017 23:10	0:05:00	52.4	69.3
18/11/2017 23:15	0:05:00	56.5	71.7
18/11/2017 23:20	0:05:00	54.4	69.3
18/11/2017 23:25	0:05:00	57.5	71.2
18/11/2017 23:30	0:05:00	56.9	75.6
18/11/2017 23:35	0:05:00	64.1	87.3
18/11/2017 23:40	0:05:00	55.7	73.5
18/11/2017 23:45	0:05:00	57.7	71.5
18/11/2017 23:50	0:05:00	58.6	75.2
18/11/2017 23:55	0:05:00	57.2	72.8
19/11/2017	0:00:07	48.4	53.4


95
90
85
80
75
70
65
60
55
50
45
40
29 Nov 19:45:00
19:50:00
19:55:00
20:00:00
20:05:00
20:10:00

Start Date and Time	Duration	LAeq	LAFmax
29/11/2017 19:40	0:02:02	60.9	75.4
29/11/2017 19:45	0:05:00	61.1	74.5
29/11/2017 19:50	0:05:00	61.9	73.9
29/11/2017 19:55	0:05:00	58.2	70.7
29/11/2017 20:00	0:05:00	60.8	76.9
29/11/2017 20:05	0:05:00	61.6	71.4
29/11/2017 20:10	0:03:22	59.9	72


Project 001
Sound
dB
140
130
120
110
100
90
80
70
60
50
40
30
20
19:30:00
19:35:00
19:40:00
19:45:00
19:50:00
19:55:00
20:00:00
20:05:00
20:10:00
20:15:00
LAeq
Cursor: 29/11/2017 19:52:47 - 19:52:48 LAeq=86.2 dB LAFmax=95.4 dB LCpeak=115.2 dB LAFmin=76.3 dB

Appendix C

Glossary of Terms

1. Noise is defined as unwanted sound. The range of audible sound is from 0 dB to 140 dB. The frequency response of the ear is usually taken to be about 18 Hz (number of oscillations per second) to 18000 Hz. The ear does not respond equally to different frequencies at the same level. It is more sensitive in the mid-frequency range than the lower and higher frequencies and because of this, the low and high frequency components of a sound are reduced in importance by applying a weighting (filtering) circuit to the noise measuring instrument. The weighting which is most widely used and which correlates best with subjective response to noise is the dB(A) weighting. This is an internationally accepted standard for noise measurements.

2. For variable noise sources such as traffic, a difference of 3 dB(A) is just distinguishable. In addition, a doubling of a noise source would increase the overall noise by 3 dB(A). For example, if one item of machinery results in noise levels of 30 dB(A) at 10 m, then two identical items of machinery adjacent to one another would result in noise levels of 33 dB(A) at 10 m. The 'loudness' of a noise is a purely subjective parameter but it is generally accepted that an increase/decrease of 10 dB(A) corresponds to a doubling/halving in perceived loudness.

3. External noise levels are rarely steady but rise and fall according to activities within an area. In an attempt to produce a figure that relates this variable noise level to subjective response, a number of noise metrics have been developed. These include:

   LAeq noise level - This is the 'equivalent continuous A-weighted sound pressure level, in decibels' and is defined in BS 7445 [1] as the 'value of the A-weighted sound pressure level of a continuous, steady sound that, within a specified time interval, T, has the same mean square sound pressure as a sound under consideration whose level varies with time'. It is a unit commonly used to describe community response plus, construction noise and noise from industrial premises and is the most suitable unit for the description of other forms of environmental noise. In more straightforward terms, it is a measure of energy within the varying noise.

   LA90 noise level - This is the noise level that is exceeded for 90% of the measurement period and gives an indication of the noise level during quieter periods. It is often referred to as the background noise level and issued in the assessment of disturbance from industrial noise.

   LA10 noise level - This is the noise level that is exceeded for 10% of the measurement period and gives an indication of the noisier levels. It is a unit that has been used over many years for the measurement and assessment of road traffic noise.