
Code of Practice on Environmental Noise Control at Concerts

THE NOISE COUNCIL

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1.0 INTRODUCTION

- 1.1 Large music events involving high powered amplification are held in sporting stadia, arenas, open air sites and within lightweight buildings. These events give pleasure to hundreds and in some cases thousands of people. However, the music from these events can cause disturbance to those living in the vicinity. The purpose of this code is to give guidance on how such disturbance or annoyance can be minimised.
- 1.2 This Code of Practice has been prepared by the Noise Council through a Working Party comprising specialists who are experienced in the particular problems that can arise with environmental noise control at concerts and similar music events. A list of members of the working party is shown in Appendix II and a list of technical papers providing some background data and more detailed information is given in Appendix I.
- 1.3 Various guidelines and criteria are described in this document covering a range of events from the single occasional concert to a full season. It is believed that compliance with the guidelines and the other advice given here will enable successful concerts to be held whilst keeping to a minimum the disturbance caused by noise. It is recognised, though, that full compliance with this code may not eliminate all complaints, and local factors may affect the likelihood of complaints.
- 1.4 This Code is not designed to address the question of environmental noise arising from discotheques, clubs and public houses, nor environmental noise affecting noise sensitive premises which are structurally attached to the venue.

- 1.5 This Code is designed to assist those planning a music event, those responsible for licensing such events and those responsible for enforcing the nuisance provisions of the Environmental Protection Act 1990 (England and Wales) and the Control of Pollution Act 1974 (Scotland). It addresses the environmental problem of noise from the performance and sound checks only. Other environmental impacts of concerts and the question of meeting the requirements of the Noise at Work Regulations 1989 and the guidance given in the Health and Safety Executive's Guide to Health, Safety and Welfare at Pop Concerts and similar events are beyond the scope of this document.
- 1.6 Compliance with this Code of Practice does not of itself confer immunity from legal obligations.
- 1.7 The Noise Council is keen to receive accounts of the practical application of the Code in order to improve and enhance its content.

2.0 DEFINITIONS

Background Noise Level:	The prevailing sound level at a location, measured in terms of the $L_{A90,T}$, on an equivalent day and at an equivalent time when no concert or sound checks are taking place.
dB(A):	The A-weighted sound pressure level whereby various frequency components of sound are weighted (equalised) to reflect the way the human ear responds to different frequencies.
Delay Tower:	An additional set of loudspeakers employed to provide a better spread of sound to the audience.
L_{Aeq} :	The equivalent continuous noise level which at a given location and over a given period of time contains the same A-weighted sound energy as the actual fluctuating noise at the same location over the same period.
$L_{A90,T}$:	The A-weighted sound pressure level exceeded for 90% of the measuring period (T).
Mixer:	The location where the main sound system is controlled. As well as ensuring the correct sound balance between the various performers, the overall level of sound for the audience is controlled at this location.

Music Event:	A concert or similar event where live or recorded music is performed by a solo or group of artists before an audience.
Music Noise:	The noise from the music and vocals during a concert or sound checks and not affected by other local noise sources.
Music Noise Level (MNL):	The L_{Aeq} of the music noise measured at a particular location.
Noise Consultant:	A person given responsibility by the organiser of the event for monitoring noise levels in accordance with the prevailing conditions, and who has the ability and authority to make decisions and implement changes in noise level during the event.
Noise Monitoring Position:	The location of the microphone within the venue from which the level of sound is monitored and controlled. For outdoor venues, this location tends to be at the mixer.
Noise-sensitive Premises:	Includes premises used for residential purposes hospitals or similar institutions, education establishments (when in use), or places of worship (during recognised times and days of worship) or any premises used for any other purposes likely to be affected by the Music Noise.
Other Urban Venue:	An urban park or similar area which is not normally used for major organised events.

Rural Venue: A park, open space or grounds of a country house in a rural area not normally used for major organised events.

Sound Engineer: Person employed to control the sound quality of the music for the audience.

Urban Stadia or Arenas: A regular venue for major sporting or similar events in an urban area.

3.0 GUIDELINES

3.1 The Music Noise Levels (MNL) when assessed at the prediction stage or measured during sound checks or concerts should not exceed the guidelines shown in Table 1 at 1 metre from the façade of any noise sensitive premises for events held between the hours of 0900 and 2300.

TABLE 1

Concert days per calendar year, per venue	Venue Category	Guideline
1 to 3	Urban Stadia or Arenas	The MNL should not exceed 75dB(A) over a 15 minute period
1 to 3	Other Urban and Rural Venues	The MNL should not exceed 65dB(A) over a 15 minute period
4 to 12	All Venues	The MNL should not exceed the background noise level ¹ by more than 15dB(A) over a 15 minute period

Notes to Table 1

1. The value used should be the arithmetic average of the hourly L_{A90} measured over the last four hours of the proposed music event or over the entire period of the proposed music event if scheduled to last for less than four hours.
2. There are many other issues which affect the acceptability of proposed concerts. This code is designed to address the environmental noise issue alone.
3. In locations where individuals may be affected by more than one venue, the impact of all the events should be considered.
4. For those venues where more than three events per calendar year are expected, the frequency and scheduling of the events will affect the level of disturbance. In particular, additional disturbance can arise if events occur on more than three consecutive days without a reduction in the permitted MNL.
5. For indoor venues used for up to about 30 events per calendar year an MNL not exceeding the background noise by more than 5dB(A) over a fifteen minute period is recommended for events finishing no later than 2300 hours.

6. Account should be taken of the noise impact of other events at a venue. It may be appropriate to reduce the permitted noise from a concert if the other events are noisy.
7. For venues where just one event has been held on one day in any one year, it has been found possible to adopt a higher limit value without causing an unacceptable level of disturbance.

3.2 For events continuing or held between the hours 2300 and 0900 the music noise should not be audible within noise-sensitive premises with windows open in a typical manner for ventilation.

Notes to Guideline 3.2

1. The use of inaudibility as a guideline is not universally accepted as an appropriate method of control. References 6 & 7 (Appendix 1) set out the various issues. This guideline is proposed as there is insufficient evidence available to give more precise guidance.
2. Control can be exercised in this situation by limiting the music noise so that it is just audible outside the noise sensitive premises. When that is achieved it can be assumed that the music noise is not audible inside the noise sensitive premises.

3.3 The nature of music events means that these guidelines are best used in the setting of limits prior to the event (see 4.0).

3.4 Assessment of noise in terms of dB(A) is very convenient but it can underestimate the intrusiveness of low frequency noise. Furthermore, low frequency noise can be very noticeable indoors. Thus, even if the dB(A) guideline is being met, unreasonable disturbance may be occurring because of the low frequency noise. With certain types of events, therefore, it may be necessary to set an additional criterion in terms of low frequency noise, or apply additional control conditions.

Notes to Guideline 3.4

1. It has been found that it is the frequency imbalance which causes disturbance. Consequently there is less of a problem from the low frequency content of the music noise near to an open air venue than further away.

2. Although no precise guidance is available the following may be found helpful (Ref 8):
A level up to 70dB in either of the 63Hz or 125Hz octave frequency band is satisfactory; a level of 80dB or more in either of those octave frequency bands causes significant disturbance.

- 3.5 Complaints may occur simply because people some distance from the event can hear it and that, consequently, they feel the music must be loud even though the guidelines are being met. In fact topographical and climatic conditions can be such that the MNL is lower at locations nearer to the venue.
- 3.6 Although care has been taken to make these guidelines compatible with what occurs at existing venues, this may not be the case at every location. Where arrangements are satisfactory with either higher or lower noise levels than those contained in the guidelines, these limits should continue.
- 3.7 It has been found that if there has been good public relations at the planning stage between the event organisers and those living nearby, annoyance can be kept to a minimum.
- 3.8 The music noise level should be measured using an integrating-averaging sound level meter complying with type 2 or better of BS6698. The background noise level should be measured using a sound level meter complying with type 2 or better of BS5969. Time weighting F (fast response) should be used.
- 3.9 When measuring L_{Aeq} in order to determine the music noise level, care must be taken to avoid local noise sources influencing the result. When the local noise is intermittent, a series of short term L_{Aeq} measurements should be made of the music noise while the local source is absent or has subsided to typically low or mean minimum values. An average of these short term

readings will give an estimate of the music noise level. A further option would be to measure the A-weighted sound pressure level on a sound level meter complying with type 2 or better of BS5969 with the time weighting set to S (slow response) when the music is loudest and not influenced by local noise. If the local source is continuous, make a measurement of the L_{Aeq} of the local source when the music is not occurring, and make a correction to the measured L_{Aeq} when the music is occurring to obtain an estimate of the music noise level.

- 3.10 The nature of many concerts requires the sound volume level to be increased during the event to enhance the performance. The prevailing noise control restrictions should be borne in mind so that the sound volume at the start of the event is not too high, hence allowing scope for an increase during the event.
- 3.11 Some concerts are accompanied by associated activities (e.g. fairgrounds) which can be noisy. These should be taken into account when setting the limit for the music noise level.
- 3.12 When monitoring the music noise level, the sound of the audience applause can be a significant contributor. It is not possible to address this issue precisely; instead it is recommended that any such effect be noted.

4.0 RECOMMENDED NOISE CONTROL PROCEDURE

4.1 This procedure has been developed over several years and found to provide an effective means of addressing the problem of environmental noise control at events. The main features of the procedure are set out below and references are made to various technical papers which give more details.

Planning

4.2 Determine the sound propagation characteristics between the proposed venue and those living nearby who might be affected by noise, and carry out an appropriate background noise survey. This should be undertaken by a competent person who is experienced in noise propagation and control, particularly from music events.

4.3 Check the viability of the event against the relevant guideline levels. This is achieved by determining from 4.2 above the sound level experienced by the audience which would allow the guidelines to be met. Research shows that the music noise level in the audience by the mixer position at pop concerts is typically 100dB(A), and that levels below 95dB(A) will be unlikely to provide satisfactory entertainment for the audience.

4.4 Prospective licensees should give the local authority as much notice as possible of the proposed event especially if more than one event is planned during a calendar year.

4.5 The local authority should make use of licensing conditions and statutory powers to implement the procedures described in this Code of Practice. Examples of possible conditions are given in Appendix III.

4.6 The Noise Consultant should be appointed.

Before the Event

4.7 Install the loudspeaker system early enough to enable alignment and orientation to be optimised to minimise noise disturbance.

4.8 Carry out a sound test prior to each event to ascertain the maximum level that can prevail at the monitoring position to enable the guidelines to be met. This effectively calibrates the system, taking into account as far as possible prevailing weather conditions, and, for indoor events, the sound insulation of the venue.

Notes to Guideline 4.8

1. It should be remembered that the introduction of an audience to a venue increases the acoustic absorption present. This has the effect of reducing the sound level in the venue for a given amplifier setting compared with the sound test. This should be borne in mind when setting the limit levels.

During the Event

4.9 Advertise and operate an attended complaint telephone number through which noise complaints can be channelled. This will enable an immediate response to the complaints to be given and the Noise Consultant to judge whether or not any adjustment to the music noise level is needed.

4.10 Establish a communication network between all those involved in noise

control. This should include the local police authority.

Note to Guideline 4.10

1. It is difficult to communicate effectively in noisy environments, especially in the vicinity of the mixer. It has been found helpful for those involved in the communication network to use head-sets with their two way radio systems.

4.11 Carry out noise monitoring within the venue at the noise monitoring position and at sample locations outside the venue throughout the event. If the event is employing one or more delay towers, additional noise monitoring may be needed inside the venue to control the sound output from them.

4.12 Although the limit value set at 4.8 above would be in terms of 15 minute L_{Aeq} , useful control can be exercised by monitoring the L_{Aeq} over one minute periods. This enables an early warning to be obtained of possible breaches in the 15 minute limit. It is sometimes appropriate to set an additional control limit in terms of the one minute L_{Aeq} (typically some 2-3dB(A) above the 15 minute value) and to use a level recorder display to assist the sound engineer in checking compliance with the limit. The Noise Consultant should advise the sound engineer of any breaches in the prescribed noise limit, to enable a reduction in level as appropriate. The sound engineer should also be advised of occasions when the limit has only just been met.

APPENDIX I

References

1. Noise Control Techniques and Guidelines for Open Air Concerts, J.E.T. Griffiths (ProcIOA, Vol. 7, Part 3, 1985).
2. A Noise Control Procedure for Open Air Pop Concerts, J.E.T. Griffiths, S.W. Turner and A.D. Wallis (ProcIOA, Vol 8, Part 4, 1986).
3. Noise Control in the Built Environment, edited by John Roberts and Diane Fairhall, Gower Technical, 1988 (Chapters 1, 2 and 3).
4. Environmental Noise Guidelines proposed for the new Health & Safety Executive Guide for Pop Concerts, J.E.T. Griffiths and A. Dove (ProcIOA, Vol 14, Part 5, 1992).
5. A Survey of Sound Levels at Pop Concerts, J.E.T. Griffiths (HSE Contract Research Report No 35/1991).
6. Inaudibility - an Established Criterion, A.W.M. Somerville (ProcIOA, Vol 13, Part 8, 1991).
7. Noise Control at All-night Acid House Raves, K. Dibble (ProcIOA, Vol 13, Part 8, 1991).
8. A study of Low Frequency Sound from Pop Concerts, J.E.T. Griffiths, J. Staunton and S. Kamath (ProcIOA, Vol 15, Part 7, 1993)

APPENDIX II

Noise Council Working Party Membership

S.W. Turner*	Technical Director, TBV Science
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J. Sargent	Building Research Establishment
J. Staunton	Associate, Travers Morgan Environment

* Full members of the Noise Council

APPENDIX III

Sample Conditions Concerning Environmental Noise Control at Concerts

- 1.0 The licensee shall appoint a suitably qualified and experienced noise control consultant⁺, to the approval of the Licensing Authority, no later than..... weeks prior to the event. The noise control consultant⁺ shall liaise between all parties including the Licensee, Promoter, sound system supplier, sound engineer and the licensing authority etc. on all matters relating to noise control prior to and during the event.

- 2.0 If not already carried out, the noise control consultant⁺ shall carry out a survey to determine the background noise levels (as defined by the Code of Practice on Environmental Noise Control at Concerts) at..... locations around the venue representative of the noise sensitive premises likely to experience the largest increase in noise/highest noise level* as a result of the concert. The information obtained from this survey shall be made available to the licensing authority..... weeks prior to the event.

- 3.0 A noise propagation test shall be undertaken at least..... hours prior to the start of the event in order to set appropriate control limits at the sound mixer position. The sound system shall be configured and operated in a similar manner as intended for the event. The sound source used for the test shall be similar in character to the music likely to be produced during the event.

- 4.0 The control limits set at the mixer position shall be adequate to ensure that Music Noise Level (MNL) shall not at any noise sensitive premises exceed.....dB(A) over a 15 minute period/the background noise level by more thandB(A) over a 15 minute period* throughout the duration of the concert.
- 5.0 The control limits set at the mixer position shall be adequate to ensure that the MNL shall not at any noise sensitive premises exceed.....dB(A) over a 15 minute period/the background noise level by more thandB(A) over a 15 minute period* throughout any rehearsal or sound check for the event.
- 6.0 The Licensee shall ensure that the promoter, sound system supplier and all individual sound engineers are informed of the sound control limits and that any instructions from the noise control consultant⁺ regarding noise levels shall be implemented.
- 7.0 The appointed noise control consultant⁺ shall continually monitor noise levels at the sound mixer position and advise the sound engineer accordingly to ensure that the noise limits are not exceeded. The Licensing Authority shall have access to the results of the noise monitoring at any time.
- 8.0 Rehearsals and sound checks are permitted only between the following hours:
.....hrs to.....hrs.

9.0 Music from the event is permitted only between the following hours:
.....hrs to.....hrs.

Note: Suitable noise conditions should also be considered with respect to minimising noise exposure to the audience and people working at the event as advised in the HSE document "Guide to Health, Safety and Welfare at Pop Concerts and Similar Events".

*delete as appropriate.

*i.e. the Noise Consultant

THE NOISE COUNCIL

The Noise Council was established by a group of professional bodies concerned with problems relating to noise and vibration in the community and industrial environments. Its aims and objectives are to promote and respond to issues relating to noise and vibration, and to make independent technical and scientific expertise available to international and national agencies, central and local government, commerce and industry.

The Founding Bodies are:

- The Chartered Institute of Environmental Health
- The Institute of Acoustics
- The Royal Environmental Health Institute of Scotland
- The Institute of Occupational Safety & Health

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Persson, K., Björkman, M., And Rylander, R., (1990), 'Loudness, Annoyance and dBA in Evaluating Low Frequency Sounds', Journal Of Low Frequency Noise And Vibration, Vol. 9, No. 1.

Excerpt:

Persons who are being disturbed by a bass beat will often say that they can both hear and feel the noise 'throbbing'. It has been suggested that the feeling associated with bass beat results from the low frequency noise causing resonance within the chest cavity of the exposed person. Therefore, the effects of low-frequency noise differ from broadband noise and research has shown that noise containing a large amount energy at lower frequency is more annoying than the same sound pressure level without the low frequency element (Persson et al, 1990).

GUIDELINES

FOR

COMMUNITY NOISE

Edited by

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This WHO document on the *Guidelines for Community Noise* is the outcome of the WHO- expert task force meeting held in London, United Kingdom, in April 1999. It bases on the document entitled "Community Noise" that was prepared for the World Health Organization and published in 1995 by the Stockholm University and Karolinska Institute.



World Health Organization, Geneva
Cluster of Sustainable Development and Healthy Environment (SDE)
Department of the Protection of the Human Environment (PHE)
Occupational and Environmental Health (OEH)

Sleep Disturbance. Measurable effects of noise on sleep begin at LAeq levels of about 30 dB. However, the more intense the background noise, the more disturbing is its effect on sleep. Sensitive groups mainly include the elderly, shift workers, people with physical or mental disorders and other individuals who have difficulty sleeping.

Sleep disturbance from intermittent noise events increases with the maximum noise level. Even if the total equivalent noise level is fairly low, a small number of noise events with a high maximum sound pressure level will affect sleep. Therefore, to avoid sleep disturbance, guidelines for community noise should be expressed in terms of the equivalent sound level of the noise, as well as in terms of maximum noise levels and the number of noise events. It should be noted that low-frequency noise, for example, from ventilation systems, can disturb rest and sleep even at low sound pressure levels.

When noise is continuous, the equivalent sound pressure level should not exceed 30 dB(A) indoors, if negative effects on sleep are to be avoided. For noise with a large proportion of low-frequency sound a still lower guideline value is recommended. When the background noise is low, noise exceeding 45 dB LAmax should be limited, if possible, and for sensitive persons an even lower limit is preferred. Noise mitigation targeted to the first part of the night is believed to be an effective means for helping people fall asleep. It should be noted that the adverse effect of noise partly depends on the nature of the source. A special situation is for newborns in incubators, for which the noise can cause sleep disturbance and other health effects.

Reading Acquisition. Chronic exposure to noise during early childhood appears to impair reading acquisition and reduces motivational capabilities. Evidence indicates that the longer the exposure, the greater the damage. Of recent concern are the concomitant psychophysiological changes (blood pressure and stress hormone levels). There is insufficient information on these effects to set specific guideline values. It is clear, however, that daycare centres and schools should not be located near major noise sources, such as highways, airports, and industrial sites.

Annoyance. The capacity of a noise to induce annoyance depends upon its physical characteristics, including the sound pressure level, spectral characteristics and variations of these properties with time. During daytime, few people are highly annoyed at LAeq levels below 55 dB(A), and few are moderately annoyed at LAeq levels below 50 dB(A). Sound levels during the evening and night should be 5–10 dB lower than during the day. Noise with low-frequency components require lower guideline values. For intermittent noise, it is emphasized that it is necessary to take into account both the maximum sound pressure level and the number of noise events. Guidelines or noise abatement measures should also take into account residential outdoor activities.

Social Behaviour. The effects of environmental noise may be evaluated by assessing its interference with social behavior and other activities. For many community noises, interference with rest/recreation/watching television seem to be the most important effects. There is fairly consistent evidence that noise above 80 dB(A) causes reduced helping behavior, and that loud noise also increases aggressive behavior in individuals predisposed to aggressiveness. In schoolchildren, there is also concern that high levels of chronic noise contribute to feelings of helplessness. Guidelines on this issue, together with cardiovascular and mental effects, must await further research.

Specific environments.

A noise measure based only on energy summation and expressed as the conventional equivalent measure, LAeq, ~~is not enough to characterize most noise environments. It is equally important to measure the~~ maximum values of noise fluctuations, preferably combined with a measure of the number of noise events. If the noise includes a large proportion of low-frequency components, still lower values than the guideline values below will be needed. When prominent low-frequency components are present, noise

measures based on A-weighting are inappropriate. The difference between dB(C) and dB(A) will give crude information about the presence of low-frequency components in noise, but if the difference is more than 10 dB, it is recommended that a frequency analysis of the noise be performed. It should be noted that a large proportion of low-frequency components in noise may increase considerably the adverse effects on health.

In Dwellings. The effects of noise in dwellings, typically, are sleep disturbance, annoyance and speech interference. For bedrooms the critical effect is sleep disturbance. Indoor guideline values for bedrooms are 30 dB LAeq for continuous noise and 45 dB LAm_{ax} for single sound events. Lower noise levels may be disturbing depending on the nature of the noise source. At night-time, outside sound levels about 1 metre from facades of living spaces should not exceed 45 dB LAeq, so that people may sleep with bedroom windows open. This value was obtained by assuming that the noise reduction from outside to inside with the window open is 15 dB. To enable casual conversation indoors during daytime, the sound level of interfering noise should not exceed 35 dB LAeq. The maximum sound pressure level should be measured with the sound pressure meter set at "Fast".

To protect the majority of people from being seriously annoyed during the daytime, the outdoor sound level from steady, continuous noise should not exceed 55 dB LAeq on balconies, terraces and in outdoor living areas. To protect the majority of people from being moderately annoyed during the daytime, the outdoor sound level should not exceed 50 dB LAeq. Where it is practical and feasible, the lower outdoor sound level should be considered the maximum desirable sound level for new development.

In Schools and Preschools. For schools, the critical effects of noise are speech interference, disturbance of information extraction (e.g. comprehension and reading acquisition), message communication and annoyance. To be able to hear and understand spoken messages in class rooms, the background sound level should not exceed 35 dB LAeq during teaching sessions. For hearing impaired children, a still lower sound level may be needed. The reverberation time in the classroom should be about 0.6 s, and preferably lower for hearing impaired children. For assembly halls and cafeterias in school buildings, the reverberation time should be less than 1 s. For outdoor playgrounds the sound level of the noise from external sources should not exceed 55 dB LAeq, the same value given for outdoor residential areas in daytime.

For preschools, the same critical effects and guideline values apply as for schools. In bedrooms in preschools during sleeping hours, the guideline values for bedrooms in dwellings should be used.

In Hospitals. For most spaces in hospitals, the critical effects are sleep disturbance, annoyance, and communication interference, including warning signals. The LAm_{ax} of sound events during the night should not exceed 40 dB(A) indoors. For ward rooms in hospitals, the guideline values indoors are 30dB LAeq, together with 40 dB LAm_{ax} during night. During the day and evening the guideline value indoors is 30 dB LAeq. The maximum level should be measured with the sound pressure instrument set at "Fast".

Since patients have less ability to cope with stress, the LAeq level should not exceed 35 dB in most rooms in which patients are being treated or observed. Attention should be given to the sound levels in intensive care units and operating theaters. Sound inside incubators may result in health problems for neonates, including sleep disturbance, and may also lead to hearing impairment. Guideline values for sound levels in incubators must await future research.

Ceremonies, Festivals and Entertainment Events. In many countries, there are regular ceremonies, festivals and entertainment events to celebrate life periods. Such events typically produce loud sounds, including music and impulsive sounds. There is widespread concern about the effect of loud music and impulsive sounds on young people who frequently attend concerts, discotheques, video arcades, cinemas, amusement parks and spectator events. At these events, the sound level typically exceeds 100 dB LAeq. Such noise exposure could lead to significant hearing impairment after frequent attendances.

Table 1: Guideline values for community noise in specific environments.

Specific environment	Critical health effect(s)	L_{Aeq} [dB(A)]	Time base [hours]	L_{Amax} fast [dB]
Outdoor living area	Serious annoyance, daytime and evening	55	16	-
	Moderate annoyance, daytime and evening	50	16	-
Dwelling, indoors	Speech intelligibility & moderate annoyance, daytime & evening	35	16	
Inside bedrooms	Sleep disturbance, night-time	30	8	45
Outside bedrooms	Sleep disturbance, window open (outdoor values)	45	8	60
School class rooms & pre-schools, indoors	Speech intelligibility, disturbance of information extraction, message communication	35	during class	-
Pre-school bedrooms, indoor	Sleep disturbance	30	sleeping-time	45
School, playground outdoor	Annoyance (external source)	55	during play	-
Hospital, ward rooms, indoors	Sleep disturbance, night-time	30	8	40
	Sleep disturbance, daytime and evenings	30	16	-
Hospitals, treatment rooms, indoors	Interference with rest and recovery	#1		
Industrial, commercial shopping and traffic areas, indoors and outdoors	Hearing impairment	70	24	110
Ceremonies, festivals and entertainment events	Hearing impairment (patrons:<5 times/year)	100	4	110
Public addresses, indoors and outdoors	Hearing impairment	85	1	110
Music and other sounds through headphones/earphones	Hearing impairment (free-field value)	85 #4	1	110
Impulse sounds from toys, fireworks and firearms	Hearing impairment (adults)	-	-	140 #2
	Hearing impairment (children)	-	-	120 #2
Outdoors in parkland and conservations areas	Disruption of tranquillity	#3		

#1: As low as possible.

Experimental noise exposure consistently produces negative after-effects on performance (Glass & Singer 1972). Following exposure to aircraft noise, schoolchildren in the vicinity of Los Angeles airport were found to be deficient in proofreading, and in persistence with challenging puzzles (Cohen et al. 1980). The uncontrollability of noise, rather than the intensity of the noise, appears to be the most critical variable. The only prospective study on noise-exposed schoolchildren, designed around the move of the Munich airport (Hygge et al. 1996; Evans et al. 1998), confirmed the results of laboratory and workplace studies in adults, as well the results of the Los Angeles airport study with children (Cohen et al. 1980). An important finding was that some of the adaptation strategies for dealing with aircraft noise, such as tuning out or ignoring the noise, and the effort necessary to maintain task performance, come at a price. There is heightened sympathetic arousal, as indicated by increased levels of stress hormone, and elevation of resting blood pressure (Evans et al. 1995; Evans et al. 1998). Notably, in the airport studies reported above, the adverse effects were larger in children with lower school achievement.

For aircraft noise, it has been shown that chronic exposure during early childhood appears to impair reading acquisition and reduces motivational capabilities. Of recent concern are concomitant psychophysiological changes (blood pressure and stress hormone levels). Evidence indicates that the longer the exposure, the greater the damage. It seems clear that daycare centers and schools should not be located near major sources of noise, such as highways, airports and industrial sites.

3.8. Effects of Noise on Residential Behaviour and Annoyance

Noise annoyance is a global phenomenon. A definition of annoyance is "a feeling of displeasure associated with any agent or condition, known or believed by an individual or group to adversely affect them" (Lindvall & Radford 1973; Koelega 1987). However, apart from "annoyance", people may feel a variety of negative emotions when exposed to community noise, and may report anger, disappointment, dissatisfaction, withdrawal, helplessness, depression, anxiety, distraction, agitation, or exhaustion (Job 1993; Fields et al. 1997 1998). Thus, although the term annoyance does not cover all the negative reactions, it is used for convenience in this document.

Noise can produce a number of social and behavioural effects in residents, besides annoyance (for review see Berglund & Lindvall 1995). The social and behavioural effects are often complex, subtle and indirect. Many of the effects are assumed to be the result of interactions with a number of non-auditory variables. Social and behavioural effects include changes in everyday behaviour patterns (e.g. closing windows, not using balconies, turning TV and radio to louder levels, writing petitions, complaining to authorities); adverse changes in social behaviour (e.g. aggression, unfriendliness, disengagement, non-participation); adverse changes in social indicators (e.g. residential mobility, hospital admissions, drug consumption, accident rates); and changes in mood (e.g. less happy, more depressed).

Although changes in social behaviour, such as a reduction in helpfulness and increased aggressiveness, are associated with noise exposure, noise exposure alone is not believed to be sufficient to produce aggression. However, in combination with provocation or pre-existing anger or hostility, it may trigger aggression. It has also been suspected that people are less willing to help, both during exposure and for a period after exposure. Fairly consistent evidence

shows that noise above 80 dBA is associated with reduced helping behaviour and increased aggressive behaviour. Particularly, there is concern that high-level continuous noise exposures may contribute to the susceptibility of schoolchildren to feelings of helplessness (Evans & Lepore 1993)

The effects of community noise can be evaluated by assessing the extent of annoyance (low, moderate, high) among exposed individuals; or by assessing the disturbance of specific activities, such as reading, watching television and communication. The relationship between annoyance and activity disturbances is not necessarily direct and there are examples of situations where the extent of annoyance is low, despite a high level of activity disturbance. For aircraft noise, the most important effects are interference with rest, recreation and watching television. This is in contrast to road traffic noise, where sleep disturbance is the predominant effect (Berglund & Lindvall 1995).

A number of studies have shown that equal levels of traffic and industrial noises result in different magnitudes of annoyance (Hall et al. 1981; Griffiths 1983; Miedema 1993; Bradley 1994a; Miedema & Vos 1998). This has led to criticism (e.g. Kryter 1994; Bradley 1994a) of averaged dose-response curves determined by meta-analysis, which assumed that all traffic noises are the same (Fidell et al. 1991; Fields 1994a; Finegold et al. 1994). Schultz (1978) and Miedema & Vos (1998) have synthesized curves of annoyance associated with three types of traffic noise (road, air, railway). In these curves, the percentage of people highly or moderately annoyed was related to the day and night continuous equivalent sound level, L_{dn} . For each of the three types of traffic noise, the percentage of highly annoyed persons in a population started to increase at an L_{dn} value of 42 dBA, and the percentage of moderately annoyed persons at an L_{dn} value of 37 dBA (Miedema & Vos 1998). Aircraft noise produced a stronger annoyance response than road traffic, for the same L_{dn} exposure, consistent with earlier analyses (Kryter 1994; Bradley 1994a). However, caution should be exercised when interpreting synthesized data from different studies, since five major parameters should be randomly distributed for the analyses to be valid: personal, demographic, and lifestyle factors, as well as the duration of noise exposure and the population experience with noise (Kryter 1994).

Annoyance in populations exposed to environmental noise varies not only with the acoustical characteristics of the noise (source, exposure), but also with many non-acoustical factors of social, psychological, or economic nature (Fields 1993). These factors include fear associated with the noise source, conviction that the noise could be reduced by third parties, individual noise sensitivity, the degree to which an individual feels able to control the noise (coping strategies), and whether the noise originates from an important economic activity. Demographic variables such as age, sex and socioeconomic status, are less strongly associated with annoyance. The correlation between noise exposure and general annoyance is much higher at the group level than at the individual level, as might be expected. Data from 42 surveys showed that at the group level about 70% of the variance in annoyance is explained by noise exposure characteristics, whereas at the individual level it is typically about 20% (Job 1988).

When the type and amount of noise exposure is kept constant in the meta-analyses, differences between communities, regions and countries still exist (Fields 1990; Bradley 1996). This is well demonstrated by a comparison of the dose-response curve determined for road-traffic noise

(Miedema & Vos 1998) and that obtained in a survey along the North-South transportation route through the Austrian Alps (Lercher 1998b). The differences may be explained in terms of the influence of topography and meteorological factors on acoustical measures, as well as the low background noise level on the mountain slopes.

Stronger reactions have been observed when noise is accompanied by vibrations and contains low frequency components (Paulsen & Kastka 1995; Öhrström 1997; for review see Berglund et al. 1996), or when the noise contains impulses, such as shooting noise (Buchta 1996; Vos 1996; Smoorenburg 1998). Stronger, but temporary, reactions also occur when noise exposure is increased over time, in comparison to situations with constant noise exposure (e.g. HCN 1997; Klæboe et al. 1998). Conversely, for road traffic noise, the introduction of noise protection barriers in residential areas resulted in smaller reductions in annoyance than expected for a stationary situation (Kastka et al. 1995).

To obtain an indicator for annoyance, other methods of combining parameters of noise exposure have been extensively tested, in addition to metrics such as LAeq,24h and L_{dn}. When used for a set of community noises, these indicators correlate well both among themselves and with LAeq,24h or L_{dn} values (e.g. HCN 1997). Although LAeq,24h and L_{dn} are in most cases acceptable approximations, there is a growing concern that all the component parameters of the noise should be individually assessed in noise exposure investigations, at least in the complex cases (Berglund & Lindvall 1995).

3.9. The Effects of Combined Noise Sources

Many acoustical environments consist of sounds from more than one source. For these environments, health effects are associated with the total noise exposure, rather than with the noise from a single source (WHO 1980b). When considering hearing impairment, for example, the total noise exposure can be expressed in terms of LAeq,24h for the combined sources. For other adverse health effects, however, such a simple model most likely will not apply. It is possible that some disturbances (e.g. speech interference, sleep disturbance) may more easily be attributed to specific noises. In cases where one noise source clearly dominates, the magnitude of an effect may be assessed by taking into account the dominant source only (HCN 1997). Furthermore, at a policy level, there may be little need to identify the adverse effect of each specific noise, unless the responsibility for these effects is to be shared among several polluters (*cf.* The Polluter Pays Principle in Chapter 5, UNCED 1992).

There is no consensus on a model for assessing the total annoyance due to a combination of environmental noise sources. This is partly due to a lack of research into the temporal patterns of combined noises. The current approach for assessing the effects of "mixed noise sources" is limited to data on "total annoyance" transformed to mathematical principles or rules of thumb (Ronnebaum et al. 1996; Vos 1992; Miedema 1996; Berglund & Nilsson 1997). Models to assess the total annoyance of combinations of environmental noises may not be applicable to those health effects for which the mechanisms of noise interaction are unknown, and for which different cumulative or synergistic effects cannot be ruled out. When noise is combined with different types of environmental agents, such as vibrations, ototoxic chemicals, or chemical odours, again there is insufficient knowledge to accurately assess the combined effects on health

(Berglund & Lindvall 1995; HCN 1994; Miedema 1996; Zeichart 1998; Passchier-Vermeer & Zeichart 1998). Therefore, caution should be exercised when trying to predict the adverse health effects of combined factors in residential populations.

The evidence on low-frequency noise is sufficiently strong to warrant immediate concern. Various industrial sources emit continuous low-frequency noise (compressors, pumps, diesel engines, fans, public works); and large aircraft, heavy-duty vehicles and railway traffic produce intermittent low-frequency noise. Low-frequency noise may also produce vibrations and rattles as secondary effects. Health effects due to low-frequency components in noise are estimated to be more severe than for community noises in general (Berglund et al. 1996). Since A-weighting underestimates the sound pressure level of noise with low-frequency components, a better assessment of health effects would be to use C-weighting.

In residential populations heavy noise pollution will most certainly be associated with a combination of health effects. For example, cardiovascular disease, annoyance, speech interference at work and at home, and sleep disturbance. Therefore, it is important that the total adverse health load over 24 hours be considered and that the precautionary principle for sustainable development is applied in the management of health effects (see Chapter 5).

3.10. Vulnerable Groups

Protective standards are essentially derived from observations on the health effects of noise on "normal" or "average" populations. The participants of these investigations are selected from the general population and are usually adults. Sometimes, samples of participants are selected because of their easy availability. However, vulnerable groups of people are typically underrepresented. This group includes people with decreased personal abilities (old, ill, or depressed people); people with particular diseases or medical problems; people dealing with complex cognitive tasks, such as reading acquisition; people who are blind or who have hearing impairment; fetuses, babies and young children; and the elderly in general (Jansen 1987; AAP 1997). These people may be less able to cope with the impacts of noise exposure and be at greater risk for harmful effects.

Persons with impaired hearing are the most adversely affected with respect to speech intelligibility. Even slight hearing impairments in the high-frequency range may cause problems with speech perception in a noisy environment. From about 40 years of age, people typically demonstrate an impaired ability to understand difficult, spoken messages with low linguistic redundancy. Therefore, based on interference with speech perception, a majority of the population belongs to the vulnerable group.

Children have also been identified as vulnerable to noise exposure (see Agenda 21: UNCED 1992). The evidence on noise pollution and children's health is strong enough to warrant monitoring programmes at schools and preschools to protect children from the effects of noise. Follow up programmes to study the main health effects of noise on children, including effects on speech perception and reading acquisition, are also warranted in heavily noise polluted areas (Cohen et al. 1986; Evans et al. 1998).

Licence conditions – general principles

- 1.16 Conditions on a premises licence or club premises certificate are important in setting the parameters within which premises can lawfully operate. The use of wording such as “must”, “shall” and “will” is encouraged. Licence conditions:
- must be appropriate for the promotion of the licensing objectives;
 - **must be precise and enforceable;**
 - **must be unambiguous and clear in what they intend to achieve;**
 - should not duplicate other statutory requirements or other duties or responsibilities placed on the employer by other legislation;
 - must be tailored to the individual type, location and characteristics of the premises and events concerned;
 - should not be standardised and may be unlawful when it cannot be demonstrated that they are appropriate for the promotion of the licensing objectives in an individual case;
 - should not replicate offences set out in the 2003 Act or other legislation;
 - **should be proportionate, justifiable and be capable of being met;**
 - cannot seek to manage the behaviour of customers once they are beyond the direct management of the licence holder and their staff, but may impact on the behaviour of customers in the immediate vicinity of the premises or as they enter or leave; and
 - should be written in a prescriptive format.

Each application on its own merits

- 1.17 **Each application must be considered on its own merits and in accordance with the licensing authority’s statement of licensing policy;** for example, if the application falls within the scope of a cumulative impact policy. Conditions attached to licences and certificates must be tailored to the individual type, location and characteristics of the premises and events concerned. This is essential to avoid the imposition of disproportionate and overly burdensome conditions on premises where there is no need for such conditions. Standardised conditions should be avoided and indeed may be unlawful where they cannot be shown to be appropriate for the promotion of the licensing objectives in an individual case.

Additional guidance

- 1.18 From time to time, the Home Office may issue additional supporting guidance to licensing authorities and other persons on the Gov.uk website. This supporting guidance is good practice guidance and should be viewed as indicative and subject to change. Such supporting guidance will broadly reflect but will not be part of the statutory guidance issued by the Secretary of State under section 182 of the 2003 Act. Licensing authorities may wish to refer to, but are under no statutory duty to have regard to such supporting guidance issued by the Home Office.

those premises should be.

- 2.14 Public safety may include the safety of performers appearing at any premises, but does not extend to the prevention of injury from participation in a boxing or wrestling entertainment.

Public nuisance

- 2.15 The 2003 Act enables licensing authorities and responsible authorities, through representations, to consider what constitutes public nuisance and what is appropriate to prevent it in terms of conditions attached to specific premises licences and club premises certificates. It is therefore important that in considering the promotion of this licensing objective, licensing authorities and responsible authorities focus on the effect of the licensable activities at the specific premises on persons living and working (including those carrying on business) in the area around the premises which may be disproportionate and unreasonable. The issues will mainly concern noise nuisance, light pollution, noxious smells and litter.
- 2.16 **Public nuisance** is given a statutory meaning in many pieces of legislation. It is however **not narrowly defined in the 2003 Act and retains its broad common law meaning.** It may include in appropriate circumstances the reduction of the living and working amenity and environment of other persons living and working in the area of the licensed premises. Public nuisance may also arise as a result of the adverse effects of artificial light, dust, odour and insects or where its effect is prejudicial to health.
- 2.17 Conditions relating to noise nuisance will usually concern steps appropriate to control the levels of noise emanating from premises. This might be achieved by a simple measure such as ensuring that doors and windows are kept closed after a particular time, or persons are not permitted in garden areas of the premises after a certain time. More sophisticated measures like the installation of acoustic curtains or rubber speaker mounts to mitigate sound escape from the premises may be appropriate. However, conditions in relation to live or recorded music may not be enforceable in circumstances where the entertainment activity itself is not licensable (see chapter 16). Any conditions appropriate to promote the prevention of public nuisance should be tailored to the type, nature and characteristics of the specific premises and its licensable activities. Licensing authorities should avoid inappropriate or disproportionate measures that could deter events that are valuable to the community, such as live music. Noise limiters, for example, are expensive to purchase and install and are likely to be a considerable burden for smaller venues.
- 2.18 As with all conditions, those relating to noise nuisance may not be appropriate in certain circumstances where provisions in other legislation adequately protect those living in the area of the premises. But as stated earlier in this Guidance, the approach of licensing authorities and responsible authorities should be one of prevention and when their powers are engaged, licensing authorities should be aware of the fact that other legislation may not adequately cover concerns raised in relevant representations and additional conditions may be appropriate.
- 2.19 Where applications have given rise to representations, any appropriate conditions should normally focus on the most sensitive periods. For example, the most sensitive period for people being disturbed by unreasonably loud music is at night and into the

early morning when residents in adjacent properties may be attempting to go to sleep or are sleeping. This is why there is still a need for a licence for performances of live music between 11 pm and 8 am. In certain circumstances, conditions relating to noise emanating from the premises may also be appropriate to address any disturbance anticipated as customers enter and leave.

- 2.20 Measures to control light pollution will also require careful thought. Bright lighting outside premises which is considered appropriate to prevent crime and disorder may itself give rise to light pollution for some neighbours. Applicants, licensing authorities and responsible authorities will need to balance these issues.
- 2.21 Beyond the immediate area surrounding the premises, these are matters for the personal responsibility of individuals under the law. An individual who engages in anti-social behaviour is accountable in their own right. However, it would be perfectly reasonable for a licensing authority to impose a condition, following relevant representations, that requires the licence holder or club to place signs at the exits from the building encouraging patrons to be quiet until they leave the area, or that, if they wish to smoke, to do so at designated places on the premises instead of outside, and to respect the rights of people living nearby to a peaceful night.

Protection of children from harm

- 2.22 The protection of children from harm includes the protection of children from moral, psychological and physical harm. This includes not only protecting children from the harms associated directly with alcohol consumption but also wider harms such as exposure to strong language and sexual expletives (for example, in the context of exposure to certain films or adult entertainment). Licensing authorities must also consider the need to protect children from sexual exploitation when undertaking licensing functions.
- 2.23 The Government believes that it is completely unacceptable to sell alcohol to children. Conditions relating to the access of children where alcohol is sold and which are appropriate to protect them from harm should be carefully considered. Moreover, conditions restricting the access of children to premises should be strongly considered in circumstances where:
- adult entertainment is provided;
 - a member or members of the current management have been convicted for serving alcohol to minors or with a reputation for allowing underage drinking (other than in the context of the exemption in the 2003 Act relating to 16 and 17 year olds consuming beer, wine and cider when accompanied by an adult during a table meal);
 - it is known that unaccompanied children have been allowed access;
 - there is a known association with drug taking or dealing; or
 - in some cases, the premises are used exclusively or primarily for the sale of alcohol for consumption on the premises.
- 2.24 It is also possible that activities, such as adult entertainment, may take place at certain times on premises but not at other times. For example, premises may operate as a café bar during the day providing meals for families but also provide entertainment with a sexual content after 8.00pm. It is not possible to give an exhaustive list of what amounts to entertainment or services of an adult or sexual nature. Applicants, responsible

Section C: The Prevention of Public Nuisance

WCC Licensing
Policy 2016.

C. Matters to be considered by Applicants

- C.1 It should be noted that provisions of the Environmental Protection Act 1990 and the Noise Act 1996 provide some protection to the general public from the effects of noise nuisance. In addition, the provisions of Part 8 of the Licensing Act 2003 enable a senior Police officer to close down instantly, for up to 24 hours, licensed premises (and premises carrying on temporary permitted activities under a temporary event notice) that are causing nuisance resulting from noise emanating from the premises. These matters should be considered before deciding whether or not conditions are necessary for the prevention of public nuisance as defined in guidance issued under Section 182 of the Licensing Act 2003.
- C.2 Applicants are advised to consult the Team Leader (Environmental Protection) at Winchester City Council before submitting their application, if they have any questions concerning the issues set out in this Section.
- C.3 When addressing public nuisance, applicants should initially identify any particular issues (having regard to their particular type of premises and/or activities) which are likely to adversely affect the promotion of the objective to prevent public nuisance. Such steps as are required to deal with these identified issues should be included within the applicant's Operating Schedule. They should also have regard to the following matters when writing their operating schedules. If the Council receives a representation at the Hearing that determines the application, additional conditions may be imposed.

Noise Controls

- C.4 Stricter conditions with regard to noise control will be expected in those areas of the District which have denser residential accommodation or low levels of background noise, such as the South Downs National Park which seeks to protect and enhance tranquillity, but this will not limit opening hours without regard to the individual merits of any application.
- C.5 The Operating Schedule must have regard to the nature of the area where the premises are situated, the type of premises concerned, the licensable activities to be provided, operational procedures and the needs of the local community. The Council will expect the Operating Schedule to demonstrate how it is intended that the premises will be "good neighbours" both to residents and to other venues and businesses and should have regard to guidance contained in the Good Practice Guide on the Control of Noise from Pubs and Clubs, March 2003 (produced by the Institute of Acoustics) and, where appropriate, the Code of Practice on Environmental Noise Control at Concerts (produced by the former Noise Council).

Noise Controls (1) Noise from Regulated Entertainment

- C.6 In established premises, the Licensing Authority expects that noise associated with regulated entertainment which takes place between the hours of 23:00 – 09:00 or takes place on a regular basis at any time should be controlled to such a level that the noise will be inaudible at all times inside all noise sensitive properties in the vicinity of the licensed premises.
- C.7 Where applicable, the applicant will be expected to adequately demonstrate that compliance with the inaudibility criteria will be achieved. Accordingly, the applicant may be required to appoint a competent noise control consultant to carry out acoustic

A. Alleged breaches of Premises Licence PREM500

Date	Time	Location	LAeq /Octave Band Frequency (Hz)	Level, 5 mins (dB)	Norsonics File ref
Fri 9 th Aug	2350	[REDACTED] Longwood Owslebury Hampshire [REDACTED]	63 Hz	66.4dB	130809 0012
Sat 10 th Aug	0025	[REDACTED] [REDACTED] Cheriton Alresford Hampshire [REDACTED]	63 Hz	69.4dB	130810 0002
Sat 10 th Aug	0137	[REDACTED] [REDACTED] Cheriton Alresford Hampshire [REDACTED]	63Hz	72.3dB	130810 0006
Sat 10 th Aug	0137	[REDACTED] [REDACTED] Cheriton Alresford Hampshire [REDACTED]	LAeq	47dB	130810 0006
Sun 11 th Aug	2145	[REDACTED] [REDACTED] Cheriton Alresford Hampshire [REDACTED]	63Hz	69.4dB	130811 0012
Sun 11 th Aug	2320	[REDACTED] Petersfield Road Cheriton Hampshire	63Hz	66.4	130811 0015

Prior to or during the interview we may wish to play excerpts of the audio recordings of these and other recordings to you.

We will also wish to question you in relation to allegations that regulated entertainment did not finish until after 0400 on Sat 10th August 2013.

David Ingram Head of Environmental Health

Call Made	Call To (CC)	Date	Time	Type (Queue Name)	Add1	Add2
B	CSC	08/08/2013	15:55	Query	[REDACTED]	Winchester
D	CC	08/08/2013	22:50	N	[REDACTED]	Tichborne
D	CC	08/08/2013	23:04	N	[REDACTED]	Cheriton
D	CC	08/08/2013	23:10	N	[REDACTED]	Cheriton
D	CC	08/08/2013	23:11	N	[REDACTED]	Cheriton
D	CC	09/08/2013	22:22	N	[REDACTED]	Cheriton
D	CC	09/08/2013	22:55	N	[REDACTED]	Kilmeston
D	CC	09/08/2013	23:18	N	[REDACTED]	Cheriton
D	CC	10/08/2013	12:50	N	[REDACTED]	
D	CC	10/08/2013	21:10	N	[REDACTED]	
D	CC	11/08/2013	11:15	N	[REDACTED]	
D	CC	11/08/2013	22:56	N	[REDACTED]	Cheriton
D	CC	11/08/2013	<u>23:06</u>	N	[REDACTED]	Cheriton