# A REVIEW OF THE NOISE COUNCIL CODE OF PRACTICE ON ENVIRONMENTAL NOISE CONTROL AT CONCERTS

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## 1 BACKGROUND

It has now been over ten years since the publication of the Noise Council Code of Practice for Concerts. In general, the guidance in the Code has been adopted at the majority of outdoor venues in the UK. This paper reviews the guidance and discusses some of the main issues that have been raised since the implementation of the recommendation of the Code. Some case studies are examined and recommendations are presented to enhance and clarify the current guidance.

## 2 CURRENT CODE OF PRACTICE FOR POP CONCERTS

The Code of Practice on Environmental Noise Control at Concerts (1) was published in 1995 by the Noise Council. The Noise Council was established by a group of professional bodies concerned with problems relating to noise in the community. The Code of Practice was prepared by a Working Party comprising of specialists who were experienced in the particular problems arising with environmental noise from concerts. These included acoustic consultants, environmental health officers from England and Scotland and a representative from the Building Research Establishment. Given the wide cross spectrum of the committee, the guidance in the Code represented a balanced view for acceptable noise guidelines.

The Code gives general guidance on concert definitions and terminology, noise guidelines, noise control procedures, sample conditions and relevant references. Whilst there are minor updates with the terminology, control procedures and references, the main issue discussed in this paper is related to the guidelines.

The recommended noise limits contained within the Code of Practice for events held between the hours of 09.00 and 23.00 hours are summarised in Table 1. These values are underpinned by the authors' previous research (2) which studied the relationship between the noise level, location of events, number of events and community response based on complaints. Other important guidance and notes attached to the table are:-

1) **More Regular Events** - For indoor events 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.

2) **Events after 2300 hours** - For events continuing between 2300 hours and 0900 hours the music should not be audible within noise-sensitive premises with windows open in a typical manner for ventilation. The Code does however qualify this guidance by stating that the use of inaudibility is not universally accepted as an appropriate method of control and that at that time, there was insufficient evidence to give more precise guidance.

**3) Low Frequency Noise** – The Code recognizes that noise in terms of dB(A) may underestimate the intrusiveness of low frequency noise and concludes that it may be necessary to set an additional criterion in terms of low frequency noise or apply additional control conditions. Two notes attached to this guidance state that low frequency noise may be more of a problem at greater distances from the event and that although there is no precise guidance, a level of 70dB in either the 63Hz or 125Hz octave frequency band is satisfactory, whereas a level of 80dB or more in either of those octave frequency bands causes significant disturbance. This was based on a study (3) by the authors of low frequency sound from concerts.

The Code provides other useful information in relation to 'one-off' events, frequency of scheduling of events and the effect of good public relations.

**Table 1 – Code of Practice Guideline Noise Limits**

| Concert days per calendar year, per venue | Venue Category | Guidelines |
|---|---|---|
| 1 to 3 | Urban Stadia and 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* by more than 15dB(A) over a 15 minute period |

*The Music Noise Level (MNL) value is the $L_{Aeq}$ due to music measured at a distance of 1 metre from the facade of any noise sensitive premises. The background noise level is the arithmetic average of the hourly $L_{Aeq}$ 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.

Whilst the majority of concerts generally adopted the guidance in table 1 of the Code, from the authors experience of dealing with a vast majority of the large scale music events in the UK, the main deviations from the Code or issues that need to be reviewed relate to:-

1) Noise level with concert numbers and Category
2) Use of low frequency limits.
3) Night time noise criteria.
4) Temporal averaging

# 3 NOISE LEVEL WITH CONCERT NUMBERS AND CATEGORY

## 3.1 One to Three Concerts

For the one to three event category, the LAeq noise limits have generally been adopted with minimal noise disturbance. As the Code recognises for venues where just a one day event is held per year, higher noise limits can be adopted without causing unacceptable disturbance. Examples of this are the concerts that used to be held at Maine Road, where environmental levels were in excess of 80LAeq and Lancashire Cricket Ground where the agreed premises licence condition is

80LAeq 15min for the nearest residential premises with 75LAeq 15 min for premises further from the ground. This supports the research (2) that states *'Although it appears that with few events, residents seem to tolerate virtually any level, a limit of 75dB(A) should achieve a maximum acceptable internal criterion.'* The only deviation from the Code is that both Maine Road and Lancashire County Cricket Ground have held more than just one event per year and have regularly held two events and on some occasions exceeded three whilst adopting this higher limit. It may therefore be appropriate for the guidance to be less prescriptive and refer to infrequent events or no more than three per annum.

Whilst some venues have higher levels than recommended by the Code, others have lower limits. In the author's experience however, it has been rare for a new venue to adopt lower limits than the Code recommends – it has generally been the case that lower limits have only been maintained at existing venues. A notable point, in case, is the Glastonbury Festival, where historically, the noise limit in the day is restricted to 60LAeq 15min. These situations are however catered for in the Code as there is a clear statement that *'where arrangements are satisfactory with either higher or lower noise levels than those contained in the guidelines, these limits should continue'.*

The only other issue is the venue categories of urban stadia and arenas (75LAeq) and other urban and rural venues (65LAeq). This is in particular related to parks and congregational spaces (city squares etc) in urban areas where there are examples of the use of 75LAeq with minimal level of complaint. Examples are given in table 2.

Table 2 – Other Urban and Rural Venues with higher limits than the Code

| Concert | Location | Number of Complaints of Music Noise* |
|---|---|---|
| Radiohead | Oxford Central Park, Oxford | 1 |
| Robbie Williams (2 shows) | Roundhay Park, Leeds | 0 (some reported to council) |
| Lovebox# | Victoria Park, London | 2 |

* Concert hotline # also low frequency limit

## 3.2 Four to Twelve Concerts

This guideline (4 to 12 concerts per annum) is based on the music LAeq noise level being up to 15dB above the background LA90 noise level. This aspect of the Code has not been tested as robustly as the 1 to 3 category for various reasons including; lack of demand, restrictions such as the limited period due to the sporting season (football etc,), the limited summer season for outdoor events and the noise limit which restricts the use for more than 3 events. Whilst this has generally been adopted for a number of venues in the UK, several known exceptions include Lancashire County Cricket Club, which has, up to six events in some years and yet retain the 75LAeq 15min limit. Concerts (some classical) at Kenwood House, Hampstead Heath had a court ruling of 12dB above background for a number of years although this was rescinded (2006) by the Licensing Panel back to 15dB above background (the Code recommendation), although the number of events was reduced from ten to eight. Another exception is the classical concerts at Garsington where concerts are set at a fixed noise limit.

One of the issues that has been raised is the step change from 3 to 4 concerts per year which in many cases means a reduction in permitted music noise level of at least 10dB depending upon the prevailing baseline level. In practice, this change is rarely achievable for many venues. It is unlikely that the increase in concerts by one reflects the change in community response that warrants a change of 10dB. Furthermore, there is some concern that the community response for 4 events is not the same as for 12 events and hence there is merit for some differential in noise

limit between either ends of the 4 to 12 event category. In practical terms, it should be noted that a number of venues have typically been seeking permission for somewhere between 3 to 6 concerts per year (they cannot stage anymore due to the restrictions previously discussed) and are currently restricted purely due to noise alone. Further research or review is recommended to assist in whether there can be sub divisions between the 4 to 12 concerts per year category.

# 4 LOW FREQUENCY LIMITS

As discussed earlier, there is no specified limit in the Code for low frequencies although there is a footnote with some helpful guidance. Whilst this is only a footnote, there have been an increasing number of council's who have adopted these low frequency limits.

The conclusions of the research (3) behind the footnote state that:-

1) At open air venues, the increase over background 'A' weighted criterion works well at minimizing complaints near to a venue.

2) The 'A' weighted criterion can underestimate annoyance at greater distances from the venue (in excess of 2km) as the mid to high frequency energy is quickly attenuated with respect to low frequency and the expectation of people living some distance from the event being that the concert should be inaudible.

3) Sound pressure levels in excess of 80dB in the 63Hz or the 125 Hz octave bands recorded in excess of 2km from the concert, are likely to give rise to complaints of low frequency noise. Levels below 70dB are likely to be acceptable.

It is clear that the research refers to low frequency noise at distances greater than 2km and yet a number of licensing authorities are specifying limits (as low as 70dB in the 63Hz and 125hz octave bands) at the nearest residential property, many within 200 metres of the concert venue. A review of some of these licence conditions has been completed by Peirce (4) in his review of low frequency criteria for concerts. The effect of imposing a 70dB limit in 63Hz and 125Hz bands is often unachievable and if enforced would prevent concerts from taking place which have in the past operated satisfactorily with limited complaints using the 'A' weighted guidance given in the Code. To put this into context, the authors have regularly measured low frequency levels (63 and 125Hz octaves) in the order of 85 to 90 Leq,15min at nearby premises whilst achieving the 75LAeq limit. This did not result in widespread disturbance close to the venue.

Given the typical spectrum of popular music which is dominated by the low frequency bass beat, would mean that meeting the 70dB low frequency limit would in effect correspond to the 'A' weighting level being some 5 to 15dB lower outside unless the sound engineer significantly altered the spectral shape of the music. In practice this level of reduction will not be achieved by purely reducing the low frequencies as it would completely change the perception and quality of the music and render the event an ineffective form of entertainment for many patrons.

Recent research (5) commissioned by Defra studied the use of different indices to best assess the disturbance caused to subjects exposed to four types of sound experienced from pubs and clubs. The sources were; guitar orientated rock music, modern dance music, karaoke and non-music entertainment (noise from sporting events relayed in pubs). Whilst there was a significant contribution of low frequency noise, in particular from the modern dance and 'rock' music, the research concluded that the noise metric that provided the best overall prediction of subjective ratings of all the entertainment noise types tested by ordinary members of the public was the Absolute $L_{Aeq}$. This supports the research (2) that underpinned the guidance in the Code which was entirely based on LAeq indices.

Given the conclusions reached by the above studies, it is recommended that the use of LAeq is continued without the need for a low frequency limit. Where a low frequency limit is to be included then heed should be taken of the original research (2) and the more recent review (4).

# 5 NIGHT TIME NOISE CRITERIA

The Code states the use of inaudibility after 2300 hours. The night time noise criterion was debated at length by the Noise Council working party and there were a number of concerns about the use of inaudibility. However without further research it was felt appropriate to err on the side of caution and specify inaudibility whilst including a footnote to indicate that it is not universally accepted as a method of control. Although inaudibility may be generally acceptable for regular night events, there is evidence to suggest that this is not necessarily the case for one-off events. The latter is directly relevant in this case, as normally concerts at night will only happen on an infrequent basis, typically once per year at a particular location.

The Pubs and Clubs research completed for Defra (5) also assessed the use of inaudibility for the assessment of music noise on the basis of infrequent events. The research concluded that the majority of members of the public recruited as laboratory test subjects reported the ability to tolerate a modest degree of audibly intrusive entertainment noise on an infrequent basis and that the threshold of audibility did not equate to a measure of acceptability.

This research supports the findings of an objective criterion used to assess the noise from one-off all night music events. An absolute criterion of 45LAeq 10min was used as a licence condition for all night music events at Turweston airfield. The criterion was based on the internal LAeq guidance of 35dB WHO guidance (6) to preserve the restorative process of sleep and allowing typically 10 to 15dB(A) reduction for a partially open window (7). Whilst there is now a more recent WHO (8) guideline value of 30LAeq for the onset of sleep disturbance, the 10-15dB range for windows still equates to an external level of 40 to 45LAeq. A technical review of the night noise limit at Turweston was published by Peirce and Garthwaite (9) which concluded that the event was successfully controlled by the use of an objective criterion. The article goes further by stating that the onset of noise complaints closely matched the transgression of the 45LAeq10min licence condition and that the use of an inaudibility criterion would have likely prevented the event taking place which was successful in environmental noise terms.

Other music events that have successfully adopted the 45LAeq night time noise limit included the all night events at Matterly Bowl near Winchester, Creamfields event at Daresbury, the Oxford Mayday Ball at Milton Common and the all night event at Brayfield near Northampton. The time averaging typically used was 15 minutes. The use of this objective criterion is therefore recommended for further consideration when dealing with an infrequent all night event.

# 6 TEMPORAL AVERAGING

The committee that drafted the Code gave this aspect considerable thought to arrive at a time period that was fair and reasonable. The extremes here are an instantaneous sound level never to be exceeded or say an hour long period. An instantaneous limit would not provide adequate ability for any transgression to be rectified while an hour long period would allow too much scope for a few extremely loud songs (with subsequent environmental impact) to be 'averaged' with sections of quiet songs or intervals.

The typical live song lasts in the order of 5 minutes and the committee concluded that limits in terms of 15 minutes would be the appropriate compromise. This period enables the means to rectify any transgression within the same time period but not so long so as to permit an extremely high level for one song.

The author's have not experienced any venues where the time period for environmental noise limits have exceeded 15 minutes but some Councils do seek shorter time periods. Time periods that have been applied include 1, 5 and 10 minutes and on occasions, a mixture of both 10 (external) and 15 minutes (internal) at the same concert. There have also been occasions where an instantaneous limit has been sought (but subsequently amended).

Most Councils do however adopt a 15 minute time period and author's view is that this still represents the most appropriate period for setting environmental limits.

# 7 CONCLUSIONS

The guidance presented in the Noise Council Code of Practice has been successfully adopted at many UK concerts throughout the past 10 years. This paper has reviewed the guidance based on the experience of authors, colleagues and with reference to case studies. It is concluded that further consideration should be given to the following.

1) The Code's noise limit of 65LAeq15min for the venue category of 'Other Urban and Rural venues' should be reviewed for areas such as parks and other congregational spaces (City Squares etc) where limits of 75LAeq have been successfully adopted.

2) Further research or review is recommended to assist in whether there is justification for different LAeq limits for sub divisions between the 4 to 12 events per year category.

3) Based on research it is recommended that the use of LAeq is continued without the need for a low frequency limit. Where a low frequency limit is to be included then heed should be taken of the distances (in excess of 2km from the venue) referenced in the original research (2) and the more recent review (4).

4) Consideration be given to the use of an objective external criterion (45LAeq 15min) for infrequent night time music events.

# 8 REFERENCES

1) Code of Practice on Environmental Noise Control at Concerts, Noise Council, 1995.

2) Environmental Noise Guidelines Proposed for the New Health & Safety Executive Guide for Pop Concerts, J.E.T Griffiths & A Dove, ProcIOA, Vol 14, Part 5, 1992.

3) A Study of Low Frequency Sound from Pop Concerts, J.E.T Griffiths, J.G Staunton & S.S Kamath, ProcIOA, Vol 15,)

4) Low Frequency Noise Criteria for Concerts, R.S Peirce, Acoustics Bulletin Nov/Dec 2004.

5) Amplified music from licensed premises – developing the new night noise offence, J.E.T Griffiths & J Seller, ProcIOA, Vol 28, Part 4, May 2006

6) Environmental Health Criteria, 12, Noise, WHO, 1980.

7) Planning and Noise, PPG24, September 1994

8) Criteria Document on Community Noise, WHO, 1995.

9) Noise Control at an All Night Event at Turweston Aerodrome, R.S Peirce & K Garthwaite, Acoustics Bulletin March/April 1998.