SUMMER EVENT SERIES-SOUND RECOMMENDATIONS

BROCKWELL PARK EVENTS 3RD, 4TH & 5TH SEPTEMBER 2021

VC-103486-AA-ENV-0001
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VANGUARDIA

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1. INTRODUCTION

1.1. Vanguardia Ltd were commissioned to assist Event Lambeth by providing technical support in relation to sound associated with the three consecutive concert events in Brockwell Park, SW2 on the 3rd, 4th and 5th September 2021.

1.2. This report describes the management of sound from the concerts and ways in which sound management can be improved for future events.

1.3. A glossary of acoustic terms is included in Appendix A

2. CONSULTANT'S EXPERIENCE

2.1. Vanguardia Limited is a specialist company dealing with the fields of sound, acoustics and vibration in all sectors including the entertainment industry. The Directors of the company have been involved with noise management issues for over 1,000 concert and festival events in the UK and overseas since the 1970's, including events in Brockwell Park and Clapham Common.

2.2. Dani Fiumicelli, Vanguardia technical director and author of this report was present for the sound checks and each day of the concerts at Brockwell Park in 2021 and is familiar with the park and its environs.

2.3. Dani was awarded the Chartered Institute of Environmental Health's Diploma in 1986 and a Master of Science (MSc) in Environmental Acoustics from the Southbank University in 1999 in which is thesis focussed on noise from outdoor concerts and festivals. Dani has over 35 years of experience in the field of acoustics having worked as an Environmental Health Officer in London from 1986 until 2002, and as an acoustic consultant since then. Dani's clients include public sector as well as private sector bodies. Dani is a corporate member of the Institute of Acoustics (IoA) and the Chartered Institute of Environmental Health Officers (CIEH), and he is a member of the IoA Environmental Noise Committee. Dani is a member of working groups revising the IOA Good Practice Guide to Noise from Place of Entertainment and the Noise Council Code of Practice on Environmental Noise from Outdoor Concerts. Dani has a wide range of experience in all technical aspects related to acoustics as presenting evidence at planning committees and appeals, licensing hearing and appeals, legal proceedings, public inquiries and House of Commons and Scottish Parliament Select Committees. Dani has presented technical papers and written articles nationally and internationally on noise and acoustics covering a wide range of aspects. Dani's overall project experience includes being the project director or manager and participant in Environmental Impact Assessments for residential schemes, schools, airports, road transport, guided transport (trams and buses), light and heavy railway projects, renewable energy, hospital development, mixed developments, harbour developments, leisure developments, sport stadiums, and commercial and industrial developments.

Since 1996 Dani has monitored and managed the sound from over 150 large scale outdoor concerts, including events in LB Lambeth.

3. LAMBETH SOUND POLICY

3.1. Limits for sound from events in Brockwell Park (and other locations in LB Lambeth) are set out in a stand-alone policy adopted by the Council in 2016[1]. The Lambeth Guidance on the control of sound at out-door events (2016) policy was adopted after extensive consultation in 2015.

3.2. The Lambeth Guidance on the control of sound at out-door events (2016) states that it aims are:

- "1*.4 The aims and objectives of this guidance are to provide event organisers, sound engineers, acoustic consultants, residents and other interested parties with information on acceptable sound levels at outdoor events held in the key Parks and Open Spaces across Lambeth (Clapham, North Lambeth, Brixton, Streatham and Norwood).*
- *1.5 This guidance, which will apply to music events from April 2016 onwards, recognises that there are competing and often conflicting interests relating to the use of Lambeth's key Parks and Open Spaces and that there is a need to manage expectations from residents and stakeholders.*
- *1.6 To help achieve a sensible compromise a number of informed tools are used to assist in striking a reasonable balance between the need to protect the public interest from unreasonable or excessive noise whilst at the same time support the business need to successfully hold viable events.*
- *1.7 It is not unreasonable to expect residents living close to a park, common or open space to experience some degree of noise disturbance during an event. On the other hand, event organisers and those attending events must also accept the fact that sound restrictions have to be imposed to protect the community*."

3.3. Essentially the Council's policy recognises that noise can be an issue arising from outdoor concerts and seeks to balance the cultural, social and economic benefits with the expectations of nearby residents for undisturbed peace and quiet, and control over what happens in the public open space near their property. In setting this balance the Lambeth policy weighs how loud the sound can be against how often, how long and how late in the

[1] See https://eventlambeth.co.uk/wp-content/uploads/2017/05/Guidance-for-Control-of-Sound-at-Outdoor-Events-2016.pdf last viewed 19th Jan 2022.

day the noise can occur. For example, large scale events are noisiest, so the Lambeth Policy only allows the highest sound levels for these types of events for relatively few days a year. The consideration of how often, how late and how many times noise may occur in the Lambeth Policy reflects the fundamental principles of the legal concept of Public Nuisance, the prevention of which is one of the four objectives of the Licensing Act 2003.

3.4. The events in Brockwell Park were subject to noise Music Noise Limits (MNLs) as set out in the Lambeth Policy and enforced via the Noise Management Plan (NMP) required under the Premises Licence conditions[2] to meet the Licensing Act 2003 objective of preventing public nuisance. The noise limits applied externally at noise sensitive premises i.e. house and flats etc. and were as follows:

- 75 dBA Leq, 15 min - to control how loud sound could be overall,

  And;

- 90 dBC Leq, 15 min - to provide a further cap on how loud low frequency "bass" sound can be.

3.5. Under the Lambeth Sound Policy, the above MNLs apply to a limited number days per year and if the number of events increases a substantially lower MNL is required i.e. the more events there are, the less noisy they become. Large scale events such as those discussed in this report would not be viable with reduced MNLs, so any additional events will be smaller in scale and scope i.e. a single stage with a much reduced audience size if a music focussed event or would be an event where music is ancillary to the range of attractions at the event and can therefore be viable at reduced levels.

3.6. The MNLs in the Lambeth Sound Policy were derived from many years' experience of events in LB Lambeth and consideration of the guidelines in the Noise Council Code of Practice for Environmental Noise from Concerts (the "Pop Code"). This code provides guidelines only and is not a statutory document that must be complied with in all cases. The noise limits in the Lambeth Sound Policy are higher than those suggested in the Code for several reasons, as follows:

[2] Similar limits apply at several other parks in London e.g. Victoria Park in LB Tower Hamlets, Queen Elizabeth Park in LB Hackney, Hyde Park in Westminster CC and Crystal Palace Park in LB Bromley

- The Pop Code suggests a lower limit for noise from an urban park compared to an urban arena or stadium. Government sponsored research published after the "Pop Code" was published shows that communities do not distinguish between noise from an event in an urban park compared to an urban arena or stadium, and therefore the higher limit can apply to both kinds of venue.
- The Pop Code was written in the early 1990's when relatively few urban parks were used for large scale outdoor concerts. Since then, many more urban parks have been used for large scale outdoor concerts at MNLs higher than the "Pop Code" indicates without undue community disturbance.
- Since the publication of the "Pop Code" the Licensing Act 2003 has introduced a less stringent test than the Code's aim of minimising disturbance.
- Experience of many large-scale events in open spaces in LB Lambeth showed that to be viable the MNLs had to be higher than "Pop Code" indicates i.e. MNLs lower than in the Lambeth Sound Policy are not sufficient for large events to be successful in open spaces in LB Lambeth.
- Multiple events in parks in LB Lambeth over 10 to 15 years operated at MNLs higher than the "Pop Code" suggests with minimal community adverse reaction.

3.7. Divergence from the MNL recommendations of the Pop Code is common and the table below lists examples of some of the venues where this occurs:

TABLE 1: EXAMPLES OF OUTDOOR VENUES WHERE THE MNLS AND/OR NUMBER OF DAYS PER YEAR IS MORE THAN RECOMMENDED BY THE "POP CODE".

Venue	Number of Concert Days per Year	Noise levels agreed for the Event	Recommendation from the Pop code	Reference Year
Crystal Palace Park	16+	75dBLAeq,15min and 90dBLCeq,15min	Less than 65dB LAeq,15min	2021
Hyde Park	6	75dBLAeq,5min	Less than 65dB LAeq,15min	2019
Victoria Park, Mile End	6	75dBLAeq,15min	Less than 65dB LAeq,15min	2021
Heaton Park, Manchester	3	75dBLAeq,15min	65dB LAeq,15min	2021
The Den, Teignmouth	2	84dBLAeq,15min	65dB LAeq,15min	2009
Godiva Festival, Coventry	3	70dBLAeq,15min	65dB LAeq,15min	2021
South Park, Oxford	Unknown	75dBLAeq,15min	65dB LAeq,15min	2017

Venue	Number of Concert Days per Year	Noise levels agreed for the Event	Recommendation from the Pop code	Reference Year
Trafalgar Square	40	79dBLAeq,5min	65dB LAeq,15min	2017
Alexandra Palace Park, Muswell hill	3/4/23	75dB/65dB/55dB LAeq,15min	65dB LAeq,15min	2018
Bellahouston Park, Glasgow	3	75dBLAeq,15min	65dB LAeq,15min	2021
Glasgow Green, Glasgow	3	75dBLAeq,15min	65dB LAeq,15min	2021
Southsea Common, Portsmouth	3	75dBLAeq,15min	65dB LAeq,15min	2018
Otterspool Park, Liverpool	2	75dBLAeq,15min	65dB LAeq,15min	2018
Isle of Wight Festival	3	75dBLAeq,15min	65dB LAeq,15min	2018
V Festival Telford	2	70dBLAeq,15min	65dB LAeq,15min	2013
Reading Festival	3	68dBLAeq,15min (70dBLAeq,15min for last 2 acts of each day)	65dB LAeq,15min	2018
Bestival	3	75dB LAeq,15min	65dB LAeq,15min	2016
London Stadium	6	75dB LAeq,15min	Less than 65dB LAeq,15min	2018
White Hart Lane	6	75dB LAeq,15min	Less than 65dB LAeq,15min	2019
Lancashire County Cricket Ground	7	80dB LAeq,15min	Less than 65dB LAeq,15min	2021
Central park, East Ham	4	75dB LAeq,15min	Less than 65dB,LAeq,15min	2007
Plat Fields	2	75dB LAeq,15min	65dB,LAeq,15min	2012
Edgeley Park, Stockport	2	75dB LAeq,15min	65dB,LAeq,15min	2019
Gunnersbury Park	6	Target: 71 LAeq,15min Max: 73 LAeq,15min	Less than 65dB,LAeq,15min	2019
Lloyd Park, Croydon	4	75dB LAeq,15min	Less than 65dB,LAeq,15min	2019
Beckenham Place Park	3	75dB LAeq,15min	65dB,LAeq,15min	2021

4. MONITORING OF MNLS

4.1. The Noise Management Plan[3] (NMP) for the event, approved under the premises licence, included several fixed monitoring locations where noise levels would be monitored during each event by the event organisers acoustic consultants. These locations are where noise levels were anticipated to be highest based on previous experience of events in the park and noise modelling of the specific events and are considered generally representative of broader impacts in the communities around the park. These locations are listed in the table below.

TABLE 2: NOISE SENSITIVE RECEPTORS IDENTIFIED IN THE NOISE MANAGEMENT PLAN

Location	MNL limit LAeq, 15 min dB	MNL limit LCeq, 15 min dB
MP1 – Parkview Towers	75	90
MP2 – Norwood Rd/Rosedale Rd	75	90
MP3 – Brockwell Park Gardens	75	90
MP4 – Dulwich Rd	75	90

4.2. In addition, sample measurements were taken at complainants' homes if they wished or in the vicinity of their property if no visit was requested.

4.3. The above MNLs apply at all sensitive locations e.g. residential properties, at any distance around the Park. Consequently, as the nearest residential locations are those worst affected by the noise from the events they become Critical Control Points (CCPs) i.e. the levels at locations further from the event are always lower than those at the CCPs nearest to the event.

4.4. Wind direction can influence how far and to where sound from an outdoor event travels. Locations that are upwind of an event typically experience lower sound levels than areas at a similar distance that are downwind of the event. This effect tends to be most noticeable at distances of more than around 300 metres from an event.

4.5. Another effect of weather is that under a minority of weather and atmospheric conditions those parts of the sound wave that would normally not be heard at ground level can be

[3] A document that formally stipulates where and how now from an event will be monitored and managed.

refracted so that they are bent back down to the ground. The radius of this bending is typically more than 1000 metres, and the normal reduction in level over distance still occurs. This can mean that some people at distance from an event who normally hear little or no noise from an event that recurs from year to year, can hear slightly more noise, or some noise when this effect occurrs. However, controlling levels at noise sensitive CCPs nearest to the event so they are below the licence requirements still means the levels further from the event comply with regulatory requirements.

4.6. However, during the events in Brockwell Park in 2021 it became clear that:

- Whilst the locations in the table above were broadly representative of noise impacts, the worst affected locations were directly on axis i.e. in-line with, the main stage PA. The highest MNL off-site occurred at the Brockwell Gate Estate adjacent to the western boundary of the park, off Tulse Hill. The properties here on Brockwell Park Row overlooking the park were subject to the highest MNLs.
- However, complaints were not solely from locations near to the park were MNLs were highest. A substantial proportion of complaints came from areas more than 500 metres from the park and screened by intervening buildings and topography. Visits to these locations established that the MNLs were significantly below the policy limits and subjectively were modest in loudness. Some complaints came from locations over a kilometre from the park where on visiting these locations despite checking that the main stage and other arenas were operating the author of this report found no music noise was audible or was only faintly intermittently audible.

5. MNL MANAGEMENT BEFORE AND DURING THE EVENTS

5.1. Vanguardia staff liaised with the Lambeth noise officers checking the event and with the acoustic consultants who were monitoring and managing the MNLs on behalf of the organiser as required by the premises licence. All three parties shared data and information to facilitate assessment of noise levels and adjustment, if necessary, to avoid breach of the licence requirements.

5.2. Consequently, no breach of the licence conditions occurred.

5.3. The receptors in table 1 above and at Brockwell Park Row are closest to the park at distances between around 125 metres to 300 metres from the main stage and were approximately 0 to 270 degrees axis to the PA[4] i.e. directly in line with, to the side of or to rear of the PA. At such distances wind direction and strength has little impact on the noise levels at these receptors. These locations are therefore CCPs that received the highest noise levels for these events, with locations further away receiving lower music noise levels, albeit influenced by wind strength and direction.

5.4. The Easterly to North-easterly winds on each day of the event were a significant factor influencing the noise complaints from locations more than around 500 metres from the park. People at these distances and further away heard low levels of music noise compared to people closer to the event. Whereas for previous events they didn't hear noise, or they heard slightly more music noise compared to similar events in previous years, when the wind was from the more usual prevailing southerly to south-westerly direction.

5.5. However, it is well established that non-acoustic factors have a significant, if not a controlling effect on the response to noise, and many events across the UK this year are reporting that the Covid-19 pandemic has had an effect in increasing sensitivity to noise in a proportion of the population, and therefore more complaints than normal have been received although established noise limits have not been exceeded.

5.6. Research shows that attitudes to noise from concerts is influenced by many non-acoustic factors. This is not unusual as extensive studies report that the response to noise from many

[4] PA = Public Address system: a system of microphones, amplifiers, and loudspeakers used to amplify speech or music in a large building or at an outdoor gathering.

sources is normally controlled by non-acoustic factors, and that noise levels and the physical characterises of sound only explain around a third of the response.

5.7. Non-acoustic factors that impact the response to noise include personality traits, socio-economic status, home tenure, age, perceptions of control, perceived fairness of decision-making regarding authorisation of the noise source, expectations of the absence of noise, and personal evaluation of the economic and social benefits i.e. the value, of the noise source.

5.8. The above means that the individual response to noise is highly variable and it is not possible to predict how different people will react to the same noise. Consequently, it is only possible and is the legal requirement, that noise is assessed and controlled in relation to the overall average or typical response of the affected community rather than to meet the requirements of individuals.

5.9. In this case facilitating wider knowledge in the community of the economic and social benefits of the events e.g. the contribution to the funding of the maintenance and improvement of Brockwell Park is considered to be an important non-acoustic factor that could help with community tolerance of the associated noise.

5.10. Notwithstanding the effects of the non-prevailing wind direction wind in skewing the dispersion of sound, comparison of the noise levels measured on and of site with those recorded in 2019 show no meaningful increase in levels on site or off site. The subjective claim by some complainants that event noise was louder in 2021 compared to previous years has been made for many events that recur each year, not just those in Brockwell Park. However, the objectively measured data shows that levels were generally the same as in previous years.

5.11. The acoustic consultants for the event organiser consisted of only two staff. There were 6 arenas on site and given the number of complaints, Vanguardia staff had to take on board at least 50% of the complaint investigations as well as audit the sound management on site.

5.12. Furthermore, unlike similar events on Clapham Common, there was no continuous sound level monitoring off-site at the locations identified in the NMP as likely to be worst affected. At these off-site monitoring locations sound measuring equipment which is wirelessly linked back to a dedicated control point on site, would facilitate continuous evaluation of noise impacts and a more rapid adjustment of levels on site if required.

5.13. Similarly, although sound levels are monitored at the mixing desk for each arena. This data was not remotely accessible from a single dedicated monitoring point on site. This meant that the organisers Sound management team were at times challenged with simultaneous complaint investigation and having manage multiple noise sources on site at the same time.

5.14. Most sound engineers for each performer were compliant with Sound management requests and effectively self-regulated the levels, but it would have been easy for levels to have got out of control and taken longer than necessary to get them back in check.

5.15. Consequently, it is recommended for future events that continual sound level monitoring at the CCP's off-site is wirelessly linked back to a dedicated control point on site. Similarly, the sound level monitoring at the mixing desk for each arena should be remotely accessible from the dedicated control point on site. This gives the Sound management team the ability to see almost instantaneously what is simultaneously happening on and off-site. This facilitates pre-empting any breach of the limits for the event so that rapid adjustments can be made to avoid the risk of this happening.

5.16. Some predictive modelling of the propagation of noise was included in the NMP for the events. However, the modelling was of a single PA set up and event layout and did not include iterations with different wind conditions. In addition, a generic PA type and set up was assumed which may have had different propagation and dispersion characteristics than the actual PA used.

5.17. For future events it is recommended that the proposed PA specification is used to model the sound dispersion from the event under at least upwind and downwind conditions, and that the model is audited by the Council's advisers sufficiently far enough in advance of the event so that any identified amendments to the design can be implemented before the PA design is finalised.

6. CONCLUSIONS

6.1. Music Noise Levels (MNLs) for the event are set by the Guidance on the control of sound at out-door events Policy approved by Lambeth Council in 2016 after extensive consultation.

6.2. The MNLs in the Lambeth Policy are informed by the guidelines of a national code of practice suitably calibrated by the experience over more than 15 years of events in open spaces in LB Lambeth.

6.3. The MNLs in the Lambeth Policy are the minimum that will allow viable large scale music orientated events i.e. lower MNLs mean these types of events are not feasible.

6.4. The MNLs in Lambeth Policy are similar to those in force for many outdoor concerts in public parks and stadia in London and across the UK.

6.5. The Lambeth policy considers how often, how late and how long an event may occur in setting MNLs and only permits the highest MNLs for large scale events for a limited number of days per year. More frequent events have substantially lower permitted MNLs as these events are smaller in scale and scope or are not primarily music orientated events so they can be viable at these reduced MNLs.

6.6. The consideration of how often, how late and how long an event may occur when setting MNLs for events reflects the core principles of the legal concept of nuisance as required in the Licensing Act 2003 objective of preventing public nuisance.

6.7. During the 2021 events in Brockwell Park MNLs were controlled in relation to the requirements of the Summer Event Series, Noise Management Plan approved under the premises licence, which in turn reflects levels set out in the Lambeth Guidance on the control of sound at out-door events. No breach of the noise limits for the events occurred.

6.8. Sample level measurements were made during each event at four critical control point locations representative of noise sensitive receptors around the common as highlighted in the Summer Event Series, Noise Management Plan for the events. An additional location not included in this noise management plan was identified early on the first day as the worst affected and sound levels were regularly monitored here during each event.

6.9. Supplementary measurements were made at or in the vicinity of complainant's properties.

6.10. Complaint numbers reached double figures on the Friday, and after adjustments were made to the PA controls there were fewer 5 complaints on the Saturday and Sunday.

6.11. Complaint numbers were higher than in previous years. This appears to be due to factors including the following:

- Wind conditions leading to noise being audible further to the west of the site compared to previous years.
- The Covid pandemic leading to increased sensitivity in a proportion of the population

6.12. Complaints are a weak measure of impact. The subjective and highly variable nature of the reaction to noise from concerts between individuals and its volatility over time means that events with broadly the same noise impacts from one year to another can trigger few complaints one year and many the next. Similarly, separate locations affected by the same levels of concert noise can produce very different numbers of complaints i.e. from zero in one location to many in another equally impacted location.

6.13. It is recommended that for future events of this nature that:

- More effort is expended explaining to the community the benefits of the concerts in raising funds that are re-invested in the park. This should not be just in terms of sums of money but also what tangible new measures are implemented, or existing resources protected or maintained.
- Detailed modelling in liaison with the sound company should be carried out of the noise from the main stage and all other arenas, sufficiently early enough to inform the design and set up of PAs to minimise the ”overspill” of sound beyond the park boundary. This modelling should be subject to review by the Council’s acoustic advisers.
- More staff should be used to monitor sound levels on and off site. A minimum of three is recommended, four would be better.
- Continuous sound level monitoring at the critical control points off site, wirelessly linked back to a dedicated control point on site is provided.
- Similarly, the sound level monitoring at each arena mixing desk should be remotely accessible from the dedicated control point on site.

APPENDIX A-ACOUSTIC GLOSSARY

A-WEIGHTING

The human ear is not equally sensitive to all frequencies of sound. The noise levels at which humans begin to hear low frequencies such as bass music, and high frequencies such as a whistle, are higher than than at the 'mid-frequencies' important for human voice communication. In order to make sound level meters, which would otherwise be indiscriminate in registering sound pressures, respond in a way which reflects human perception of sound, they usually are fitted with a set of filters to progressively filter out the high and low frequency energy. The filters are made to an internationally standardised specification and the filtered noise level is said to be 'A-weighted'. Sometimes A-weighted decibel levels are denoted 'dB(A)', but the correct, internationally standardised format for reporting requires the 'A' to be appended to the noise descriptor e.g. $L_{Aeq,T}$, L_{A90},T etc.

AMBIENT NOISE

This is the totally encompassing sound at the measurement position over a specified time interval and usually comprises sound from many different sources both near and far.

ATTENUATION

A general term used to indicate the reduction of noise, or the amount (in decibels) by which it is reduced.

AVERAGING

In the absence of a dominant steady source, the sound level at a point, indoors or outdoors, varies continuously and often considerably from moment to moment, minute nitute, hout t ohour etc. For example, the variation may be over a few dB about an average value in a quiet room, or over 10 dB or more in a noisy outdoor environment. In order to define a level to represent the relative level of noise in the space it is necessary to define that average value. The most common averaging methods are energy averaging ($L_{Aeq,T}$) which is biased towards thre ludest noises in the assesment period as these have the most energy and statistical averaging (L_{AN} where N is a percentageo of time the stated level is exceeded between 1% and 100%) which can describe how quiet a location is ($L_{A90,T}$) or the peak noise level e.g $L_{Amax,T}$.

BACKGROUND NOISE LEVEL, $L_{A90,T}$

Background noise level is a term used to describe that level to which the noise falls during quiet spells, when there is lull in passing traffic for example. It is quantified by the LA90,T noise metric which is the noise level exceeded for 90% of the measurement time interval, T.

C-WEIGHTING

Whilst A-weighting provides a reasonable approxiamation of the human hearing response, especialy at low and moderate loudness, it doesn't always appropriately reflect the perception of sounds with prominent low frequency e.g bass, content. Instead a C-weighting can be applied to the measured sound presurre level which gives more emphasis to the low frequency content. C-weighted deibels are often denoted as dBC. Any C-weighted benchmark has to be higher than the A-weighted equivalent and monitoring of outdoor concerts has identified an upper threshold of 90 dB LCeq,t to be appropriate for relatively infrequent music noise during the day and evening as above this threhold the numbers of complaints have increased noticeably.

DECIBELS

Noise conventionally is measured in decibels (dB). The decibel is a logarithmic unit and decibel levels do not add and subtract arithmetically. An increase or decrease of 3 dB in the level of a steady noise is about the smallest that is noticeable. It represents a doubling or halving of noise energy. An increase or decrease of 10 dB represents a ten-fold change in noise energy, and is normally perceived as a doubling or halving of loudness. The threshold of hearing for a typical young, healthy adult is 0 dB A-weighted sound pressure level. A noise level of 140 dB(A) can cause physical pain. Most people listen to their televisions at about 60 to 65 dB(A). Alongside a busy main road the ambient noise level may be in the 70 to 80 dB(A) range; on a quiet day in the country it might be as low as 30 dB, in town 40 to 50 dB(A).

DECIBEL ADDITION

If two similar noise sources operate together their combined noise level at an observer's position some distance away is 3 dB higher than the noise level generated by just one of them. If two further machines are switched on the noise level generated by all four at the observer's position is 3 dB higher than the level generated by the two. If the number of machines is again doubled, to eight, the noise level increases by another 3 dB, and so on.

EQUIVALENT CONTINUOUS A-WEIGHTED SOUND PRESSURE LEVEL, $L_{Aeq,T}$

The 'equivalent continuous A-weighted sound pressure level' is an average of the fluctuating sound energy in a space. It is the value of the A-weighted sound pressure level of a continuous, steady sound that, over the specified time period, T seconds, has the same root mean square sound pressure as the varying sound. Although an average of the noise energy varying over a defined period T, the logarithmic nature of the decibel means that the overall $L_{Aeq,T}$ will be biased towards the highest noise during the assesment period as this has the most noise energy e.g 70 decibels has 10 times the energy of 60 decibels, and 100 times the energy of 50 decibels.

FAÇADE SOUND LEVELS

Noise levels often are specified in terms of the sound level at a position 1 m in front of the most exposed façade of potentially noise sensitive premises. Such levels include an acoustic relfection off the façade and are assumed to be 3 dB(A) higher than sound levels measured at an equivalent position without the noise reflected off the building façade and any other surfaces (excluding the ground), and called free-field noise. Measuring music noise as façade levels is a problem as the refection of the often prominent low frequency (bass) with longer wave length content can cause fluctuations in level between otherwise equivalent one measurement positions. Instead measurments in free-field conditions are more reliable and uncertainty due to acoustic refelections minimised.

MUSIC NOISE LEVELS (MNL)

The $L_{Aeq,T}$ of the music noise measured at a particular location without interference from extraneous ambient noise.

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